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Analysis of Hot/Cold Cycle Requirements for Heavy-Duty Vehicles

by

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16. ABSTRACT

EPA has recently been involved in the development of transient engine and chassis cycles from the CAPE-21 survey data. The CAPE-21 survey data was gathered from eighty-eight in-use trucks; forty-four in New York City and forty-four in Los Angeles. Vehicle speed, engine rpm, engine power, engine temperature, and various traffic and road describers were recorded on tape, at approximately one second intervals. Prior to the actual generation of the cycles, the need for a unique cold start cycle (engine and/or chassis) was investigated. This report summarizes this investigation.

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I. Foreword

EPA has been recently involved in the development of transient engine and chassis cycles from the CAPE-21 survey data. The CAPE-21 survey data was gathered from eighty-eight in-use trucks; forty-four in New York City and forty-four in Los Angeles. Vehicle speed, engine rpm, engine power, engine temperature, and various traffic and road describers were recorded on tape. at approximately one second intervals. Prior to the actual generation of the cycles, the need for a unique cold start cycle (engine and/or chassis) was investigated. This report summarizes this investigation.

II. Summary

Objective

The purpose of this report is to determine if there is a need for a unique cold start cycle for heavy-duty (HD) transient emission testing.

Results

The temperature analysis was done on CAPE-21 truck data by Olson Laboratories (EPA HD cycle development contractor). The summary statistics were obtained from a representative cross section of trucks surveyed during CAPE-21 for which reliable second-by-second temperature data were available. A complete copy of the summary statistics provided by Olson can be found in Appendix I.

The results from the analysis indicate that there does not appear to be a significant difference in hot versus cold truck operation from a practical viewpoint. Cold operation constitutes 2.3% of the total operation. The only definite trend identified during the analysis was a longer than normal initial idle following a cold start.

Conclusions

There does not appear to be a substantial difference in vehicle/engine operation following a cold, warm, normal or hot start. The only exception to this is that a cold start is typically followed by a slightly longer than normal idle period. Consequently, the sole requirement for a cold start portion of an emission test cycle is an idle period of approximately twenty seconds immediately following engine start-up.

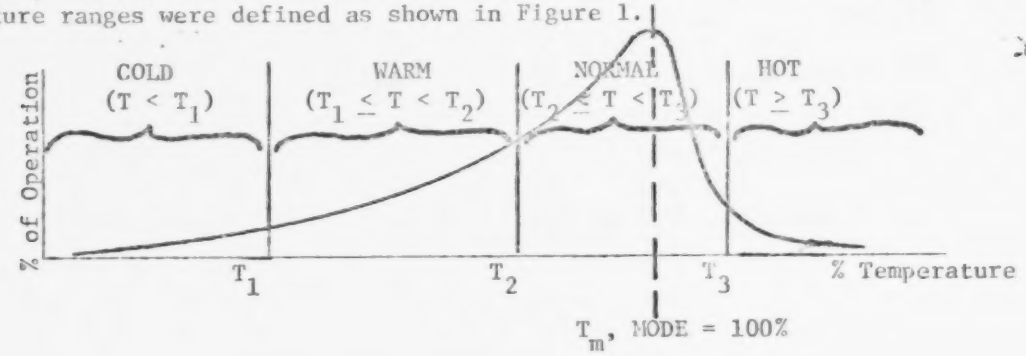
III. Data Analysis

A. Background and Description of Appendix I (Temperature Analysis Statistics).

The temperature analysis statistics (Appendix I) were derived from the truck data listed in Table 1. The analysis of hot/cold cycle requirements and resulting conclusions summarized in this report were derived from these statistics. The data used in the analysis included % power,[1] % RPM,[2] MPH, and % temperature[3] recorded on a second-by-second basis. The data analysis was performed on each of the following truck categories:

1) Los Angeles (LA) gas trucks
2) New York (NY) gas trucks
3) LA Diesel trucks
4) NY Diesel trucks
5) All LA trucks
6) All NY trucks
7) All gas trucks
8) All Diesel trucks
9) All trucks

For the temperature analysis it was necessary to identify cold, warm, normal, and hot starts. The cold, warm, normal, and hot temperature ranges were defined as shown in Figure 1.



Typical Truck Temperature Distribution

FIGURE 1

All of the second-by-second trucks temperature data was first normalized to the modal value of the temperature frequency distribution. Then using engineering judgement the temperature cutoff values (T_1, T_2,

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[1] Normalized to maximum value at each rpm

[2] $$\% \text{ RPM} = \frac{\text{RPM} - \text{RPM}_{\text{IDLE}}}{\text{RPM}_{\text{RATED}} - \text{RPM}_{\text{IDLE}}} \times 100$$

[3] Normalized to the mode of the temperature distribution for each truck

Table 1

Truck Data Used in Temperature Analysis

Truck Category	Total Number of Trucks	Total Number of Truck Days	Total Number of Records*
Los Angeles (LA) Gas	10	15	223384
New York City (NY) Gas	7	11	206779
LA Diesel	7	12	270556
NY Diesel	3	5	124915
All LA Trucks	17	27	493940
All NY Trucks	10	16	331694
All Gas	17	26	430163
All Diesel	10	17	395471
All Trucks	27	43	825634

*1 Record = .864 Seconds

Table 2

TYPE OF START									
COLD START $T < T_1$				WARM START $T_1 \leq T < T_2$			NORMAL START $T_2 \leq T < T_3$		HOT START $T \geq T_3$
TYPE OF OPERATION				TYPE OF OPERATION			TYPE OF OPERATION		TYPE OF OPERATION
COLD	WARM	NORMAL	HOT	WARM	NORMAL	HOT	NORMAL	HOT	HOT
$T<T_1$	$T_1 \leq T<T_2$	$T_2 \leq T<T_3$	$T \geq T_3$	$T_1 \leq T<T_2$	$T_2 \leq T<T_3$	$T \geq T_3$	$T_2 \leq T<T_3$	$T \geq T_3$	$T \geq T_3$
MATRIX M_1	MATRIX M_2	MATRIX M_3	MATRIX M_4	MATRIX M_5	MATRIX M_6	MATRIX M_7	MATRIX M_8	MATRIX M_9	MATRIX M_{10}

and T_3), in percent, were selected. The temperature cutoff values were determined on a truck day basis. In other words, each truck day of data had its own T_1, T_2, and T_3. It is possible that a truck with several days of operation would have slightly different temperature cutoff values for each day.

As a further stratification, the operation after a cold, warm, normal, and hot start was broken into the same temperature ranges shown in Figure 1. Table 2 illustrates this perhaps in a clearer manner.

For example matrix M_4 would contain the truck operation (% power, % RPM, and MPH data) that occurred within the temperature range $T \geq T_3$ after a cold start. A cold start being defined as any operation that occurs after an engine-off and initially begins in matrix M_1, $T < T_1$.

Matrix M_{10} contains operation that would occur after a brief engine-off period. After a brief engine-off, the engine would initially start-off hot ($T \geq T_3$) due to heat build-up occurring during the engine-off period. After the truck runs for a short time the engine would cool somewhat, and the operation would then fall in the normal range. However, for purposes of the temperature analysis it was decided that any operational data after a hot start ($T \geq T_3$) would be placed in matrix M_{10}, regardless of subsequent operating temperature ranges. Consequently, there is operation in matrix M_{10} that really should be placed in the normal temperature range ($T_2 \leq T < T_3$).

For each of the individual matrices and selected combinations of matrices the following statistics were calculated in the temperature analysis:

1) Mean % power,
2) Mean % RPM,
3) Mean % idle,
4) Mean time in M_1, M_2, etc. per trip (i.e., average "trip segment" time)
5) Associated standard deviations for all of the above (1 through 4), and
6) Number of records in each matrix.

In addition, average time of the engine-offs before each type of start (cold, warm, normal, and hot), the average idle times at beginning of start (initial idle), the average total trip times, and the standard deviations for each were calculated. Also, the distribution and density functions were derived. The above statistics were calculated for each trip type (cold start, warm start, normal start, and hot start) for each of the previously listed truck categories.

All of the previously described statistics can be found in Appendix I ("Temperature Analysis Statistics").

B) Selected Statistics from Appendix I (Temperature Analysis Statistics)

After deriving the numerous statistics discussed earlier and listed in Attachment I, EPA's cycle development contractor performed significance tests to ascertain the difference in truck operation (% power and % RPM data) as a function of engine operating temperature. The test used was the Kolmogorov-Smirnov (K-S) one-sample test.

The K-S test is concerned with the degree of agreement between two distributions. It determines whether two distributions can reasonably be thought to have come from the same population. Specifically, the test involves comparing cumulative frequency distributions. The tests of significance were performed within categories (i.e., LA gas) and also between categories.

Almost without exception, the results demonstrated that there was a significant difference in operation not only as a function of temperature but also type of start. Refer to Attachment I for detailed results of significance tests.

The statistics indicate that all the matrices are significantly different (level of statistical test was .05). This would indicate, in an extreme case, that different engine cycles are required for each matrix of each truck category. This approach obviously is unreasonable from a practical standpoint. Consequently, another avenue was taken to quantify the effects of engine operating temperature on truck operation.

Rather than taking a statistical approach, an engineering analysis was performed. This topic will be discussed further under section IV (Discussion). The first step in this analysis was to extract important parameters from the detailed statistical summary in Appendix I. The parameters selected were means of percent power, percent RPM, MPH and percent idle. These parameters are considered the most significant in identifying the influence of engine operating temperature on truck operation.

Tables 3 through 7 summarize the means of percent power, percent RPM, MPH and percent idle for various matrices and matrix combinations. The following list concisely describes the contents of these tables.

Table No.	Description
3	Cold operation following a cold start (M_1) is compared to the range of means for all other operation (M_2 to M_{10}).
4	Normal operation following cold, warm, and normal starts (M_3, M_6 and M_8) are compared.
5	Warm operation following cold starts (M_2) is compared to warm operation following warm starts (M_5).
6	Normal and hot operation following a cold start ($M_3 + M_4$) is compared to normal and hot operation following warm, normal, and hot starts ($M_6 + M_7 + M_8 + M_9 + M_{10}$).
7	Cold and warm operation following cold and warm starts ($M_1 + M_2 + M_5$) is compared to normal and hot operation following cold, warm, normal and hot starts ($M_3 + M_4 + M_6 + M_7 + M_8 + M_9 + M_{10}$).

Additional information taken from Appendix I includes the number of records in each of the matrices. Table 8 summarizes this data. Converting the records listed in Table 8 to percent of total operation produces Table 9. This gives a relative indication of the amount of operation in each matrix.

Finally, Table 10 lists the mean, standard deviation, and median of the initial idle time following cold, warm, normal, and hot starts.

IV. Discussion

In the succeeding discussion engineering judgment was used to a great degree. A rigorous statistical analysis implied that all operation (matrices M_1 to M_{10}) for each truck category, was significantly different. Although the statistical tests indicate a "statistical" difference there may not be a "practical" difference. A statistical difference depends upon the statistical test used. A practical difference depends upon how the results will be used, the physical meaning of the results, and the practical limitations of the results. The statistical tests utilized in Appendix I imply that each matrix ideally would require a separate engine cycle. This is impractical, so a practical approach is taken for deciding whether a hot/cold cycle is required for HD emission testing. Engineering intuition and judgment are relied upon for the following analysis.

The differences and range of values acceptable in combining truck categories (2-axle + 3-axle + TT) for engine cycle generation are used

Table 3

Summary Statistics Comparing Cold Operation Following a Cold Start (M_1) to the Range of Means for all Other Operation (M_2 to M_{10})

% POWER

Truck Category	Mean % Power for Matrix M_1 (Cold Start-Cold Operation)	Range of Mean % Power for Matrices M_2 to M_{10} (All Other Operation)
LA Gas	25	32-58
NY Gas	18	1-34
LA Diesel	11	2-49
NY Diesel	33	8-53

% RPM

Truck Category	Mean % RPM for Matrix M_1 (Cold Start-Cold Operation)	Range of Mean % RPMs for Matrices M_2 to M_{10} (All Other Operation)
LA Gas	20	27-68
NY Gas	10	-12-24
LA Diesel	26	6-74
NY Diesel	29	5-29

MPH

Truck Category	Mean MPH for Matrix M_1 (Cold Start-Cold Operation)	Range of Mean MPHs for Matrices M_2 to M_{10} (All Other Operation)
LA Gas	11	16-41
NY Gas	6	0-18
LA Diesel	8	1-37
NY Diesel	10	1-15

% IDLE

Truck Category	Mean % Idle for Matrix M_1 (Cold Start-Cold Operation)	Range of Mean % Idles for Matrices M_2 to M_{10} (All Other Operation)
LA Gas	46	17-44
NY Gas	46	25-72
LA Diesel	49	12-94
NY Diesel	30	31-84

Table 4

Summary Statistics Comparing Normal Operation Following Cold, Warm, and Normal Starts (M_3, M_6, and M_8)

MEAN % POWER

Truck Category	Matrix M_3 (Cold Start-Normal Operation)	Matrix M_6 (Warm Start-Normal Operation)	Matrix M_8 (Normal Start-Normal Operation)
LA Gas	58	57	36
NY Gas	22	1	18
LA Diesel	32	49	35
MY Diesel	23	32	21

MEAN % RPM

Truck Category	Matrix M_3 (Cold Start-Normal Operation)	Matrix M_6 (Warm Start-Normal Operation)	Matrix M_8 (Normal Start-Normal Operation)
LA Gas	48	68	36
NY Gas	14	-1	7
LA Diesel	65	74	60
NY Diesel	18	17	19

MEAN MPH

Truck Category	Matix M_3 (Cold Start-Normal Operation)	Matrix M_6 (Warm Start-Normal Operation)	Matrix M_8 (Normal Start-Normal Operation)
LA Gas	36	41	23
NY Gas	10	0	7
LA Diesel	31	37	24
NY Diesel	8	9	9

MEAN % IDLE

Truck Category	Matrix M_3 (Cold Start-Normal Operation)	Matrix M_6 (Warm Start-Normal Operation)	Matrix M_8 (Normal Start-Normal Operation)
LA Gas	24	35	29
NY Gas	41	60	49
LA Diesel	20	12	33
NY Diesel	41	33	48

Table 5 .

Summary Statistics Comparing Warm Operation Following Cold Starts (M_2) and Warm Starts (M_5)

MEAN % POWER

Truck Category	Matrix M_2 (Cold Start-Warm Operation	Matrix M_5 (Warm Start-Warm Operation
LA Gas	48	47
NY Gas	32	34
LA Diesel	32	35
NY Diesel	29	53

MEAN % RPM

Truck Category	Matrix M_2 (Cold Start-Warm Operation	Matrix M_5 (Warm Start-Warm Operation
LA Gas	44	46
NY Gas	24	10
LA Diesel	69	59
NY Diesel	21	29

MEAN MPH

Truck Category	Matrix M_2 (Cold Start-Warm Operation	Matrix M_5 (Warm Start-Warm Operation
LA Gas	30	23
NY Gas	18	14
LA Diesel	32	22
NY Diesel	11	15

MEAN % IDLE

Truck Category	Matrix M_2 (Cold Start-Warm Operation	Matrix M_5 (Warm Start-Warm Operation
LA Gas	17	23
NY Gas	29	30
LA Diesel	15	18
NY Diesel	32	31

Table 6

Summary Statistics Comparing Normal and Hot Operation Following Warm, Normal, and Hot Starts (M_6, M_7, M_8, M_9 and M_{10})

MEAN % POWER

Truck Category	Matrix ($M_3 + M_4$) (Cold Start - Normal and Hot Operation)	Matrix ($M_6 + M_7 + M_8 + M_9 + M_{10}$) (Warm, Normal, and Hot Starts - Normal and Hot Operation)
LA Gas	53	44
NY Gas	21	21
LA Diesel	32	40
NY Diesel	23	20

MEAN % RPM

Truck Category	Matrix ($M_3 + M_4$) (Cold Start - Normal and Hot Operation)	Matrix ($M_6 + M_7 + M_8 + M_9 + M_{10}$) (Warm, Normal, and Hot Starts - Normal and Hot Operation)
LA Gas	44	44
NY Gas	14	10
LA Diesel	65	65
NY Diesel	18	18

MEAN MPH

Truck Category	Matrix ($M_3 + M_4$) (Cold Start - Normal and Hot Operation)	Matrix ($M_6 + M_7 + M_8 + M_9 + M_{10}$) (Warm, Normal, and Hot Starts - Normal and Hot Operation)
LA Gas	32	29
NY Gas	10	9
LA Diesel	31	28
NY Diesel	8	8

MEAN % IDLE

Truck Category	Matrix ($M_3 + M_4$) (Cold Start - Normal and Hot Operation)	Matrix ($M_6 + M_7 + M_8 + M_9 + M_{10}$) (Warm, Normal and Hot Starts - Normal and Hot Operation)
LA Gas	28	28
NY Gas	36	42
LA Diesel	20	30
NY Diesel	41	55

Table 7

Summary Statistics Comparing Cold and Warm Operation Following Cold and Warm Starts ($M_1 + M_2 + M_5$) to Normal and Hot Operation Following Cold, Warm, Normal, and Hot Starts ($M_3 + M_4 + M_6 + M_7 + M_8 + M_9 + M_{10}$)

MEAN % POWER

Truck Category	Matrix ($M_1 + M_2 + M_5$) (Cold and Warm Starts - Cold and Warm Operation	Matrix ($M_3 + M_4 + M_6 + M_7 + M_8 + M_9 + M_{10}$) (Cold, Warm, Normal and Hot Starts - Normal and Hot Operation)
LA Gas	43	45
NY Gas	29	21
LA Diesel	26	37
NY Diesel	34	21

MEAN % RPM

Truck Category	Matrix ($M_1 + M_2 + M_5$) (Cold and Warm Starts - Cold and Warm Operation	Matrix ($M_3 + M_4 + M_6 + M_7 + M_8 + M_9 + M_{10}$) (Cold, Warm, Normal and Hot Starts - Normal and Hot Operation)
LA Gas	40	44
NY Gas	19	11
LA Diesel	53	65
NY Diesel	24	18

MEAN MPH

Truck Category	Matrix ($M_1 + M_2 + M_5$) (Cold and Warm Starts - Cold and Warm Operation	Matrix ($M_3 + M_4 + M_6 + M_7 + M_8 + M_9 + M_{10}$) (Cold, Warm, Normal and Hot Starts - Normal and Hot Operation)
LA Gas	24	29
NY Gas	14	9
LA Diesel	22	29
NY Diesel	11	8

MEAN % IDLE

Truck Category	Matrix ($M_1 + M_2 + M_5$) (Cold and Warm Starts - Cold and Warm Operation	Matrix ($M_3 + M_4 + M_6 + M_7 + M_8 + M_9 + M_{10}$) (Cold, Warm, Normal and Hot Starts - Normal and Hot Operation)
LA Gas	31	28
NY Gas	36	41
LA Diesel	27	28
NY Diesel	31	52

Table 8

NUMBER OF RECORDS* IN EACH MATRIX AND VARIOUS MATRIX COMBINATIONS

	Cold Start				Warm Start			Normal Start		Hot Start				
	M1 Cold	M2 Warm	M3 Normal	M4 Hot	M5 Warm	M6 Normal	M7 Hot	M8 Normal	M9 Hot	M10 Hot	M1 + M2 + M5	M3 + M4	M3 + M4 + M6 + M7 + M8 + M9 + M10	M6 + M + M8 + M9 + M
LA Gas	3762	9232	16467	3761	6592	17117	508	38540	617	126788	19586	20228	203798	183570
NY Gas	3165	7761	48182	6804	1482	814	0	78086	2641	59844	12408	52986	194371	141385
LA Diesel	9386	13337	79506	0	10109	59579	0	97421	1218	0	32832	79506	237734	158218
NY Diesel	2583	6612	19067	0	1708	2393	804	81104	5269	5375	10903	19067	114012	94945
All LA Trucks	13148	22569	95973	3761	16701	76696	508	135961	1835	126788	52418	99734	441522	341788
All NY Trucks	5748	14373	65249	6804	3190	3207	804	159190	7910	65219	23311	72053	308383	236330
All Gas	6927	16993	62649	10565	8074	17931	508	116626	3258	186632	31994	73214	398169	324955
All Diesel	11969	19949	98573	0	11817	61972	804	178525	6487	5375	43735	98573	351736	253163
All Truck	18896	36942	161222	10565	19891	79903	1312	295151	9745	192007	75729	171787	749905	578118

* 1 Record = .864 Seconds

Table 9

% OF TOTAL OPERATION IN EACH MATRIX
AND VARIOUS MATRIX COMBINATIONS

	COLD START				WARM START			NORMAL START		HOT START	VARIOUS MATRIX COMBINATIONS				
	M1 COLD	M2 WARM	M3 NORMAL	M4 HOT	M5 WARM	M6 NORMAL	M7 HOT	M8 NORMAL	M9 HOT	M10 HOT	M1+2+5	M3+4	M3+4, M6-M10	M6-M10	M1-M10
LA GAS	1.7	4.1	7.4	1.7	3.0	7.7	.2	17.3	.3	56.8	8.8	9.1	91.2	82.2	100.0
NY GAS	1.5	3.8	22.3	3.3	.7	.4	0	37.8	1.3	28.9	6.0	25.6	94.0	68.4	100.0
LA DIESEL	3.5	4.9	29.4	0	3.7	22.0	0	36.0	.5	0	12.1	29.4	87.9	58.5	100.0
NY DIESEL	2.1	5.3	15.3	0	1.4	1.9	.6	64.9	4.2	4.3	8.7	15.3	91.3	76.0	100.0
ALL LA TRUCKS	2.7	4.6	19.4	.8	3.4	15.5	.1	27.5	.4	25.7	10.6	20.2	89.4	69.2	100.0
ALL NY TRUCKS	1.7	4.3	19.7	2.1	1.0	1.0	.2	48.0	2.4	19.7	7.0	21.7	93.0	71.2	100.0
ALL GAS	1.6	4.0	14.6	2.5	1.9	4.2	.1	27.1	.8	43.4	7.4	17.0	92.6	75.5	100.0
ALL DIESEL	3.0	5.0	24.9	0	3.0	15.7	.2	45.1	1.6	1.4	11.1	24.9	88.9	64.0	100.0
ALL TRUCKS	2.3	4.5	19.5	1.3	2.4	9.7	.2	35.7	1.2	23.3	9.2	20.8	90.8	70.0	100.0

Table 10

INITIAL IDLE TIME
(IN MINUTES)

(an asterisk indicates a frequency of one or less)

	TRIP TYPE															
	COLD START			N	WARM START			N	NORMAL START			N	HOT START			N
	MEAN	MEDIAN	STD DEV		MEAN	MEDIAN	STD DEV		MEAN	MEDIAN	STD DEV		MEAN	MEDIAN	STD DEV	
LA GAS:	1.56	0.43	2.44	17	0.56	0.37	0.71	11	0.34	0.10	0.63	39	0.18	0.10	0.27	88
NY GAS:	1.78	0.23	2.69	10	0.86	0.35	1.23	4	1.25	0.20	3.00	22	0.44	0.10	1.20	62
LA DIESEL:	2.85	0.67	4.19	15	0.40	0.10	0.57	19	0.26	0.13	0.32	26	*	*	*	0
NY DIESEL:	0.05	0.02	0.08	6	0.20	0.10	0.23	3	0.34	0.13	0.33	9	*	*	*	1
ALL LA TRUCKS:	2.17	0.47	3.38	32	0.46	0.25	0.62	30	0.31	0.10	0.53	65	0.18	0.10	0.27	88
ALL NY TRUCKS:	1.13	0.03	2.25	16	0.58	0.27	0.95	7	0.98	0.20	2.55	31	0.43	0.10	1.19	63
ALL GAS:	1.64	0.40	2.48	27	0.64	0.37	0.84	15	0.67	0.17	1.90	61	0.28	0.10	0.80	150
ALL DIESEL:	2.05	0.20	3.74	21	0.37	0.10	0.53	22	0.28	0.13	0.32	35	*	*	*	1
ALL TRUCKS:	1.82	0.30	3.07	48	0.48	0.27	0.68	37	0.53	0.15	1.53	96	0.28	0.10	0.80	151

as general guidance for deciding whether cold truck operation is different from other operating modes (warm, normal and hot). The EPA technical report "Category Selection for Transient Heavy-Duty Chassis and Engine Cycles," May 1978, addresses the acceptable range in various parameters for the grouping of the truck categories.

Table 3 compares cold operation following a cold start (M_1) to the range of means for all other operation (M_2 to M_{10}). Percent power, percent RPM, MPH, and percent idle are examined. In most cases the means for matrix M_1 fall within the range of means of the other matrices. However, there are instances where the means of all four parameters fall outside the ranges of the other matrices. It appears from Table 3 that cold operation following a cold start may be different from all other modes of operation.

Table 4 compares normal operation following cold, warm, and normal starts (M_3, M_6, and M_8). Means of % power, % RPM, MPH, and % idle are listed. For three of the four truck categories (LA gas, LA Diesel, and NY Diesel) the normal operation following cold, warm, and hot start appears similar.

The normal operation seems different for NY gas trucks. Matrix M_6 appears to be the culprit. The fact that the mean MPH is zero and the average % power and % RPM is near zero, suggest that all of the data in this particular matrix is idle. Also Table 8 indicates that a very limited amount of data fell in this matrix. These facts indicate that not too much weight should be placed on the mean values for this matrix. When excluding matrix M_6, the normal operation for NY gas trucks also appears similar.

Warm operation following cold starts (M_2) is compared to warm operation following warm starts (M_5) in Table 5. The mean of % power, % RPM, MPH, and % idle indicate that the operation in both matrices for the four truck categories is similar.

Table 6 compares normal and hot operation following a cold start ($M_3 + M_4$) to normal and hot operation following warm, normal, and hot starts ($M_6 + M_7 + M_8 + M_9 + M_{10}$). After observing the means, one can easily conclude that normal and hot operation following cold starts is the same as that following warm, normal, and hot starts in most cases.

Finally, Table 7 compares all cold and warm operation ($M_1 + M_2 + M_5$) to all normal and hot operation ($M_3 + M_4 + M_6 + M_7 + M_8 + M_9 + M_{10}$). Again the means of the various parameters, for the most part, demonstrate that cold and warm operation after a cold start is not much different than normal and hot operation after any type start.

Also, of importance is Table 10. This table shows the length of the initial idle following a cold, warm, normal, and hot start. It should be noted that there are large differences between the means and medians which indicate that the density functions are not normally

distributed. This fact supports the use of the median rather than the mean as a measure of central tendency. Keeping this point in mind, the medians do indicate that a cold start is characteristically followed by a longer than normal idle period. This fact suggests that if a cold start emission test is decided upon, it should begin with an extended idle period.

V. Conclusions

In conclusion, truck operation following a cold, warm, normal, or hot start does not seem to be substantially different. The only noteworthy difference is that cold starts are typically followed by a slightly longer idle period. Also, Table 9 illustrates that only 2.3% of the total operation constitutes truly cold operation (at least for the truck data used in the temperature analysis).

Based on the above conclusions, it appears that it is not necessary to generate unique cold start cycles (engine or chassis) from a matrix containing cold operation only. The sole requirement for a cold start cycle is a longer than normal idle period (approximately 20 seconds) following engine start-up. The opening cycle segment selected for the complete emission test cycle should contain this idle period at the beginning.

APPENDIX I

TEMPERATURE ANALYSIS STATISTICS

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APPENDIX I

TEMPERATURE ANALYSIS STATISTICS
(POWERED) - MEAN/STD DEV
(AN ASTERISK INDICATES A FREQUENCY OF 1 OR LESS)

	COLD START				WARM START			NORMAL START		HOT START				M3 + M4 + M5 + M7 + M9 + M10	M6 + M7 + M8 + M9 + M10
	M1 COLD	M2 WARM	M3 NORMAL	M4 HOT	M5 WARM	M6 NORMAL	M7 HOT	M8 NORMAL	M9 HOT	M10 HOT	M1 + M2 + M5	M3 + M4			
LA GAS	24.78 10.07	47.97 35.57	58.26 34.79	32.42 36.33	47.14 39.57	56.92 35.80	43.16 46.89	36.01 36.17	33.60 34.04	44.18 36.86	43.32 37.15	53.25 36.55	44.77 37.11		43.77 37.04
NY GAS	18.19 25.11	31.40 33.18	21.67 32.56	20.17 30.94	24.34 32.62	8.92 5.12	* *	17.71 28.27	17.74 9.35	26.32 34.04	28.77 31.87	21.39 32.36	21.13 31.15		21.04 30.72
LA DIESEL	10.59 17.10	31.72 26.91	32.00 30.04	* *	34.97 32.39	48.61 32.69	* *	34.84 34.90	1.66 9.04	* *	26.10 28.45	32.00 30.04	37.32 33.49		39.92 34.75
NY DIESEL	32.56 32.94	24.79 32.31	22.86 32.46	* *	31.19 30.93	32.05 32.72	7.92 16.57	20.64 29.89	15.36 24.99	16.59 26.31	34.32 34.91	22.86 32.46	29.86 30.81		20.23 29.46
ALL LA TRUCKS	14.61 23.63	39.23 31.80	37.23 32.77	32.42 36.33	46.00 36.04	50.64 33.67	43.16 46.89	35.19 35.29	12.29 25.83	44.18 36.86	32.67 33.29	37.01 32.95	40.97 35.50		42.08 36.11
ALL NY TRUCKS	24.09 29.99	33.73 32.42	21.68 32.53	20.17 30.94	24.16 31.25	23.05 31.11	7.92 16.57	19.18 29.13	16.14 20.90	25.33 33.47	31.28 33.39	21.82 32.40	20.95 30.72		20.70 30.21
ALL GAS	21.93 28.22	41.14 35.47	32.50 37.23	25.29 33.84	44.77 38.70	54.14 36.98	43.16 46.89	23.62 32.20	20.73 18.19	38.89 36.96	38.05 36.01	31.43 36.85	33.69 36.41		34.18 36.29
ALL DIESEL	14.40 23.69	30.89 28.24	30.06 30.80	* *	37.66 34.06	47.95 32.83	7.92 16.57	28.13 33.39	12.84 23.16	16.59 26.31	28.05 30.30	30.06 30.80	31.39 33.29		32.18 34.16
ALL TRUCKS	17.15 25.67	35.98 32.46	31.03 33.52	25.29 33.84	40.68 36.27	49.47 34.02	20.94 35.69	26.27 32.98	15.43 21.95	38.17 36.87	32.47 33.32	30.66 33.57	32.73 33.03		33.32 35.42

TEMPERATURE ANALYSIS STATISTICS
(SPREE) - MEAN/STD DEV
(AN ASTERISK INDICATES A FREQUENCY OF 1 OR LESS)

	COLD START				WARM START			NORMAL START		HOT START					
	M1 COLD	M2 WARM	M3 NORMAL	M4 HOT	M5 WARM	M6 NORMAL	M7 HOT	M8 NORMAL	M9 HOT	M10 HOT	M1 + M2 + M5	M3 + M4	M3 + M4 + M6 + M7 + M8 + M9 + M10	M6 + M7 + M8 + M9 + M10
LA GAS	20.22	44.03	47.54	26.68	45.74	68.03	43.50	36.34	36.06	43.36	40.03	43.66	44.11	44.16
	24.73	28.11	24.70	24.53	36.22	37.89	39.13	31.15	24.60	32.01	32.01	25.97	32.40	33.03
NY GAS	10.45	24.17	13.87	13.34	9.83	-0.59	*	7.30	-12.29	15.77	18.96	13.80	11.38	10.47
	18.91	25.17	20.12	17.01	18.21	3.16	*	19.54	12.18	20.45	23.92	19.75	20.32	20.46
LA DIESEL	25.67	68.78	65.14	*	59.03	74.26	*	60.14	6.14	*	53.46	65.14	65.07	65.04
	35.09	34.63	39.41	*	37.31	31.42	*	40.63	20.38	*	39.92	39.41	38.66	38.28
NY DIESEL	24.17	21.04	18.27	*	28.99	16.71	4.80	18.94	10.39	13.51	24.21	18.27	18.03	17.98
	27.37	25.36	24.46	*	25.06	20.94	13.35	27.72	23.94	20.05	26.23	24.46	24.01	27.02
ALL LA TRUCKS	24.11	58.66	62.12	26.68	53.79	72.87	43.50	53.39	16.20	43.36	48.44	60.79	59.43	53.83
	32.56	34.35	37.89	24.53	37.45	32.09	39.13	39.66	26.05	32.01	37.72	38.07	37.43	37.05
ALL NY TRUCKS	18.06	22.73	15.16	13.34	20.09	12.32	4.80	13.23	2.82	15.59	21.41	14.59	13.84	13.49
	25.16	25.31	21.57	17.01	24.11	19.65	13.35	24.75	23.36	20.43	25.17	21.19	23.07	23.61
ALL GAS	15.75	34.96	22.72	18.09	39.15	64.91	43.50	16.90	-3.14	34.51	31.86	22.05	28.13	29.50
	22.77	28.57	26.04	21.01	36.40	36.07	39.13	27.62	24.37	31.56	30.90	25.43	31.73	32.83
ALL DIESEL	26.44	52.06	46.08	*	54.69	72.03	4.80	41.42	9.40	13.51	46.17	46.08	49.82	47.39
	33.69	30.99	41.47	*	37.33	33.00	13.35	40.87	23.37	20.05	39.09	41.37	41.53	41.33
ALL TRUCKS	22.51	44.63	43.11	18.09	48.38	70.44	19.79	31.73	5.34	33.92	40.12	41.58	38.31	37.34
	30.59	30.73	39.67	21.01	37.73	33.84	32.51	38.16	24.46	31.49	36.55	39.25	38.22	37.85

TEMPERATURE ANALYSIS STATISTICS

(UNWEIGHTED) - MEAN/STD DEV

(AN ASTERISK INDICATES A FREQUENCY OF 1 OR LESS)

	COLD START				WARM START			NORMAL START		HOT START				M3 + M4 + M6 + M7 + M8 + M9 + M10	M6 + M7 + M8 + M9 + M10
	M1 COLD	M2 WARM	M3 NORMAL	M4 HOT	M5 WARM	M6 NORMAL	M7 HOT	M8 NORMAL	M9 HOT	M10 HOT	M1 + M2 + M5	M3 + M4			
LA GAS	10.64 15.03	30.45 20.82	35.76 17.76	17.85 15.88	23.33 21.11	40.51 20.44	22.34 22.29	23.30 20.16	16.05 11.18	29.40 21.62	24.25 21.25	32.43 18.77	29.42 21.41		29.09 21.66
NY GAS	5.82 8.70	17.88 16.09	9.76 12.07	8.46 10.87	14.16 12.00	0.06 0.26	* *	7.30 11.55	0.80 2.61	12.76 14.79	14.36 14.99	9.59 11.93	9.49 12.90		9.45 13.25
LA DIESEL	8.27 13.03	32.17 19.49	31.26 23.39	* *	22.34 18.97	36.70 20.73	* *	23.68 20.67	0.86 3.54	* *	22.31 20.23	31.26 23.39	29.36 22.31		28.41 21.69
NY DIESEL	10.17 8.80	10.85 12.71	8.15 10.64	* *	15.43 14.16	8.53 10.01	1.05 2.98	8.91 12.24	2.91 6.08	7.96 12.46	11.41 12.28	8.15 10.64	8.40 11.78		8.44 11.99
ALL LA TRUCKS	8.95 13.67	31.46 20.06	32.03 22.50	17.85 15.88	22.73 19.84	37.55 20.73	22.34 22.29	23.57 20.53	5.96 10.09	29.40 21.62	23.03 20.64	31.49 22.53	29.39 21.90		28.78 21.67
ALL NY TRUCKS	7.73 9.01	14.65 15.05	9.29 11.69	8.46 10.87	14.84 13.21	6.38 9.40	1.05 2.98	8.12 11.94	2.21 5.28	12.37 14.67	12.98 13.87	9.21 11.62	9.08 12.51		9.04 12.77
ALL GAS	8.44 12.77	24.71 19.82	16.60 17.92	11.80 13.64	21.65 20.07	38.68 21.67	22.34 22.29	12.58 16.74	3.69 8.05	24.07 21.17	20.41 19.67	15.90 17.45	19.69 20.38		20.55 20.88
ALL DIESEL	8.68 12.26	25.10 20.20	26.79 23.37	* *	21.34 18.51	35.62 21.13	1.05 2.98	16.97 18.85	2.53 5.75	7.96 12.46	19.59 19.16	26.79 23.37	22.57 21.86		20.92 21.01
ALL TRUCKS	8.59 12.45	24.92 20.03	22.83 21.99	11.80 13.64	21.47 19.16	36.30 21.29	9.30 17.47	15.24 18.17	2.91 6.63	23.62 21.14	19.94 19.38	22.15 21.73	21.04 21.13		20.71 20.94

TEMPERATURE ANALYSIS STATISTICS
PERCENT IDLE - MEAN/STD DEV
(AN ASTERISK INDICATES A FREQUENCY OF 1 OR LESS)

	COLD START				WARM START			NORMAL START		HOT START				M3 + M4 + M6 + M7 + M8 + M9 + M10	M6 + M7 + M8 + M9 + M10
	M1 COLD	M2 WARM	M3 NORMAL	M4 HOT	M5 WARM	M6 NORMAL	M7 HOT	M8 NORMAL	M9 HOT	M10 HOT	M1 + M2 + M5	M3 + M4			
LA GAS	45.72 37.48	17.03 19.51	24.48 31.52	38.09 39.22	23.37 24.56	35.01 30.89	43.72 61.84	29.06 23.54	62.71 40.78	25.41 23.20	30.62 31.59	27.89 32.76	28.28 26.08		28.33 25.36
NY GAS	45.50 42.95	28.96 33.46	40.70 38.44	25.13 47.92	29.82 34.69	59.68 57.02	* *	48.83 32.99	72.46 37.90	36.59 25.47	36.30 37.34	35.51 40.19	41.26 31.05		42.03 29.72
LA DIESEL	49.20 34.17	14.68 24.70	19.62 27.65	* *	17.90 18.27	11.98 12.78	* *	32.82 29.50	93.51 7.49	* *	26.74 29.67	19.62 27.65	28.10 31.02		30.45 31.76
NY DIESEL	29.73 18.30	32.13 20.55	41.03 23.96	* *	30.78 20.37	33.47 2.81	84.08 *	48.18 15.25	74.25 9.62	47.50 *	30.81 18.00	41.03 23.96	52.06 20.25		54.66 19.16
ALL LA TRUCKS	47.35 35.43	15.81 21.96	21.95 29.05	38.09 39.22	19.90 20.55	19.95 23.13	43.72 61.84	30.56 25.93	78.11 31.75	25.41 23.20	28.53 30.46	24.18 30.33	26.23 27.45		28.86 27.02
ALL NY TRUCKS	39.56 35.78	30.09 28.66	40.80 33.60	25.13 47.92	30.23 27.21	46.58 36.27	84.08 *	48.64 28.70	73.26 27.46	36.76 25.30	34.23 31.24	37.11 36.39	43.08 29.72		44.01 28.62
ALL GAS	45.64 38.77	21.91 26.08	31.43 34.71	31.61 41.13	25.09 26.41	39.50 34.47	43.72 61.84	36.19 28.70	68.13 36.99	30.03 24.70	32.66 33.59	31.48 35.83	33.44 28.81		33.68 27.90
ALL DIESEL	43.64 31.34	19.27 24.43	24.66 27.73	* *	19.66 18.60	14.24 13.84	84.08 *	36.77 27.22	83.88 13.03	47.50 *	27.66 27.39	24.66 27.73	34.31 30.39		36.88 30.75
ALL TRUCKS	44.76 35.36	20.69 25.05	28.40 31.55	31.61 41.13	21.86 21.92	23.50 26.11	57.18 49.54	36.40 28.02	75.54 28.71	30.14 24.66	30.20 30.67	28.66 32.91	33.64 29.15		34.37 28.52

TEMPERATURE ANALYSIS STATISTICS
TRIP SEGMENT TIME(MIN) - MEAN/STD DEV
(AN ASTERISK INDICATES A FREQUENCY OF 1 OR LESS)

	COLD START				WARM START			NORMAL START		HOT START				
	M1 COLD	M2 WARM	M3 NORMAL	M4 HOT	M5 WARM	M6 NORMAL	M7 HOT	M8 NORMAL	M9 HOT	M10 HOT	M1 + M2 + M5	M3 + M4	M3 + M4 + M6 + M7 + M8 + M9 + M10	M6 + M7 + M8 + M9 + M10
LA GAS	3.19	10.23	19.76	13.54	8.63	27.39	3.66	14.23	2.22	20.75	6.88	18.21	18.57	18.62
	1.84	5.70	20.49	19.43	4.34	40.05	0.14	15.62	3.39	29.89	5.11	19.78	26.36	27.00
NY GAS	4.69	12.42	78.39	24.47	5.36	5.85	*	91.11	7.61	13.90	7.77	56.64	20.91	22.37
	1.84	12.41	58.50	13.85	1.83	6.39	*	56.12	12.90	14.04	8.58	54.91	38.65	33.86
LA DIESEL	9.01	13.74	88.07	*	7.65	50.47	*	53.96	4.38	*	9.85	88.07	57.05	48.48
	6.29	10.92	84.32	*	4.70	38.88	*	65.85	4.31	*	7.74	84.32	64.12	55.42
NY DIESEL	6.20	19.04	68.64	*	8.23	17.23	11.58	109.77	18.97	77.40	11.21	68.64	78.18	80.42
	3.21	12.49	94.50	*	6.24	0.16	*	113.55	11.53	*	9.76	94.80	99.06	97.89
ALL LA TRUCKS	5.92	12.04	55.28	13.54	8.02	42.48	3.66	30.12	3.30	20.75	8.48	49.52	29.16	26.04
	5.32	8.82	73.43	19.43	4.52	40.08	0.14	47.15	3.77	29.89	6.79	67.13	43.79	38.31
ALL NY TRUCKS	5.17	14.78	72.28	24.49	6.59	11.55	11.58	73.95	12.66	14.91	9.07	61.03	35.53	31.51
	2.43	12.36	67.92	13.85	4.76	8.33	*	83.43	12.99	16.09	9.07	62.71	55.40	53.37
ALL GAS	3.65	11.12	42.56	19.02	7.75	23.47	3.66	27.53	5.21	17.92	7.20	36.35	21.88	20.08
	1.93	8.83	48.99	16.68	4.35	36.92	0.14	39.69	9.78	24.78	6.52	43.62	32.00	29.88
ALL DIESEL	8.21	15.12	83.50	*	7.73	46.97	11.58	73.45	11.68	77.40	10.16	83.50	62.53	56.96
	5.65	11.25	84.20	*	4.76	38.15	*	85.79	11.20	*	8.17	84.20	73.34	69.85
ALL TRUCKS	5.67	12.97	61.09	19.02	7.74	38.35	6.30	44.27	8.25	18.31	8.65	53.78	31.48	28.03
	4.56	10.10	69.14	16.68	4.54	38.81	4.57	64.19	10.67	25.17	7.49	65.07	48.36	44.37

TEMPERATURE ANALYSIS STATISTICS
NUMBER OF RECORDS

	COLD START				WARM START			NORMAL START		HOT START				
	M1 COLD	M2 WARM	M3 NORMAL	M4 HOT	M5 WARM	M6 NORMAL	M7 HOT	M8 NORMAL	M9 HOT	M10 HOT	M1 + M2 + M5	M3 + M4	M3 + M4 + M6 + M7 + M8 + M9 + M10	M6 + M7 + M8 + M9 + M10
LA GAS	3762	9232	16467	3761	6592	17117	508	38540	617	126788	19586	20228	203798	183570
NY GAS	3165	7761	46182	6804	1482	814	0	78086	2641	59844	12408	52986	194371	141385
LA DIESEL	9386	13337	79506	0	10109	59579	0	97421	1218	0	32832	79506	237724	158218
NY DIESEL	2583	6612	19067	0	1708	2393	804	81104	5269	5375	10903	19067	114012	94945
ALL LA TRUCKS	13148	22569	95973	3761	16701	76696	508	135961	1835	126788	52418	99734	441522	341788
ALL NY TRUCKS	5748	14373	65249	6804	3190	3207	804	159190	7910	65219	23311	72053	306383	236330
ALL GAS	6927	16993	62649	10565	8074	17931	508	116626	3258	186632	31994	73214	398169	324955
ALL DIESEL	11969	19949	98573	C	11817	61972	804	178525	6487	5375	43735	98573	351736	253163
ALL TRUCKS	18896	36942	161222	10565	19891	79903	1312	295151	9745	192007	75729	171787	749905	578118

SUMMARY STATISTICS
(AN ASTERISK INDICATES A FREQUENCY OF ONE OR LESS)

INITIAL IDLE TIME
(IN MINUTES)

	TRIP TYPE							
	COLD START		WARM START		NORMAL START		HOT START	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
LA GAS:	1.56	2.44	0.56	0.71	0.34	0.63	0.18	0.27
NY GAS:	1.78	2.69	0.86	1.23	1.25	3.00	0.44	1.20
LA DIESEL:	2.85	4.19	0.40	0.57	0.26	0.32	*	*
NY DIESEL:	0.05	0.08	0.20	0.23	0.34	0.33	*	*
ALL LA TRUCKS:	2.17	3.38	0.46	0.62	0.31	0.53	0.18	0.27
ALL NY TRUCKS:	1.13	2.25	0.58	0.95	0.98	2.55	0.43	1.19
ALL GAS:	1.64	2.48	0.64	0.84	0.67	1.50	0.28	0.80
ALL DIESEL:	2.05	3.14	0.37	0.53	0.28	0.32	*	*
ALL TRUCKS:	1.82	3.07	0.48	0.68	0.53	1.53	0.28	0.80

SUMMARY STATISTICS
(AN ASTERISK INDICATES A FREQUENCY OF ONE OR LESS)

TOTAL TRIP TIME
(IN MINUTES)

	TRIP TYPE							
	COLD START		WARM START		NORMAL START		HOT START	
	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV	MEAN	STD DEV
LA GAS:	28.14	28.25	31.70	41.54	14.46	15.79	20.75	29.89
NY GAS:	92.03	78.39	8.27	8.84	52.84	57.76	13.90	14.08
LA DIESEL:	98.14	91.97	52.82	40.06	54.63	66.36	*	*
NY DIESEL:	67.83	80.85	23.54	22.91	138.20	112.83	*	*
ALL LA TRUCKS:	60.95	74.11	45.07	41.21	30.53	47.56	20.75	29.89
ALL NY TRUCKS:	82.96	77.54	14.81	16.75	77.62	85.33	14.91	16.09
ALL GAS:	51.90	60.05	25.45	36.94	28.30	40.88	17.92	24.78
ALL DIESEL:	89.48	88.05	48.82	39.13	76.12	87.22	*	*
ALL TRUCKS:	68.29	75.17	39.35	39.49	45.73	65.67	18.31	25.17

SUMMARY STATISTICS
(AN ASTERISK INDICATES A FREQUENCY OF ONE OR LESS)

ENGINE-OFF TIME
(IN MINUTES)

	TRIP TYPE: COLD START MEAN	COLD START STD DEV	WARM START MEAN	WARM START STD DEV	NORMAL START MEAN	NORMAL START STD DEV	HOT START MEAN	HOT START STD DEV
LA GAS:	32.50	43.13	76.91	56.14	28.23	24.05	13.65	12.34
NY GAS:	*	*	54.25	44.92	28.14	22.68	9.35	6.07
LA DIESEL:	167.33	241.54	62.63	56.06	17.81	16.88	*	*
NY DIESEL:	*	*	45.50 ~~46511.06~~	83.01 ~~8491.34~~	20.22	16.15	*	*
ALL LA TRUCKS:	113.40	187.32	67.87	55.56	24.06	21.93	13.65	12.34
ALL NY TRUCKS:	*	*	51.33 ~~7141.14~~	71.15 ~~1825.52~~	26.70	20.84	9.51	6.14
ALL GAS:	32.50	43.13	70.87	52.84	28.67	23.28	11.87	10.42
ALL DIESEL:	126.75	213.27	61.00 ~~2891.05~~	83.32 ~~10240.02~~	18.43	16.49	*	*
ALL TRUCKS:	95.33	173.29	63.36 ~~4064.24~~	85.03 ~~7933.33~~	24.89	21.52	11.92	10.40

DISTRIBUTION FUNCTIONS FOR INITIAL ICLE TIME
LA GAS:

SECONDS	COLD START FREQ.	COLD START DENS.	COLD START DIST.	WARM START FREQ.	WARM START DENS.	WARM START DIST.	NORMAL START FREQ.	NORMAL START DENS.	NORMAL START DIST.	HOT START FREQ.	HOT START DENS.	HOT START DIST.
0	4	23.53	23.53	0	0.0	0.0	1	2.56	2.56	2	2.27	2.27
2	0	0.0	23.53	0	0.0	0.0	4	10.26	12.82	23	26.14	28.41
4	1	5.88	29.41	1	9.09	9.09	8	20.51	33.33	17	19.32	47.73
6	1	5.88	35.29	1	9.09	18.18	8	20.51	53.85	18	20.45	68.18
8	0	0.0	35.29	1	9.09	27.27	1	2.56	56.41	5	5.68	73.86
10	0	0.0	35.29	0	0.0	27.27	4	10.26	66.67	5	5.68	79.55
12	0	0.0	35.29	0	0.0	27.27	1	2.56	69.23	1	1.14	80.68
14	1	5.88	41.18	0	0.0	27.27	1	2.56	71.79	2	2.27	82.95
16	0	0.0	41.18	1	9.09	36.36	2	5.13	76.92	3	3.41	86.36
18	0	0.0	41.18	0	0.0	36.36	0	0.0	76.92	0	0.0	86.36
20	0	0.0	41.18	1	9.09	45.45	1	2.56	79.49	1	1.14	87.50
22	0	0.0	41.18	1	9.09	54.55	0	0.0	79.49	1	1.14	88.64
24	1	5.88	47.06	0	0.0	54.55	1	2.56	82.05	1	1.14	89.77
26	1	5.88	52.94	1	9.09	63.64	0	0.0	82.05	1	1.14	90.91
28	0	0.0	52.94	0	0.0	63.64	0	0.0	82.05	0	0.0	90.91
30	1	5.88	58.82	1	9.09	72.73	0	0.0	82.05	0	0.0	90.91
32	1	5.88	64.71	0	0.0	72.73	0	0.0	82.05	0	0.0	90.91
34	0	0.0	64.71	0	0.0	72.73	0	0.0	82.05	0	0.0	90.91
36	0	0.0	64.71	1	9.09	81.82	2	5.13	87.18	2	2.27	93.18
38	0	0.0	64.71	0	0.0	81.82	0	0.0	87.18	1	1.14	94.32
40	0	0.0	64.71	0	0.0	81.82	0	0.0	87.18	1	1.14	95.45
42	1	5.88	70.59	0	0.0	81.82	0	0.0	87.18	0	0.0	95.45
44	0	0.0	70.59	0	0.0	81.82	0	0.0	87.18	0	0.0	95.45
46	0	0.0	70.59	1	9.09	90.91	0	0.0	87.18	1	1.14	96.59
48	0	0.0	70.59	0	0.0	90.91	0	0.0	87.18	0	0.0	96.59
50	0	0.0	70.59	0	0.0	90.91	1	2.56	89.74	0	0.0	96.59
52	0	0.0	70.59	0	0.0	90.91	2	5.13	94.87	0	0.0	96.59
54	0	0.0	70.59	0	0.0	90.91	0	0.0	94.87	0	0.0	96.59
56	0	0.0	70.59	0	0.0	90.91	0	0.0	94.87	0	0.0	96.59
58	0	0.0	70.59	0	0.0	90.91	0	0.0	94.87	0	0.0	96.59
1	0	0.0	70.59	0	0.0	90.91	1	2.56	97.44	3	3.41	100.00
2	1	5.88	76.47	1	9.09	100.00	0	0.0	97.44	0	0.0	100.00
3	2	11.76	88.24	0	0.0	100.00	1	2.56	100.00	0	0.0	100.00
4	0	0.0	88.24	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
5	0	0.0	88.24	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
6	1	5.88	94.12	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
7	0	0.0	94.12	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
8	1	5.88	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
9	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
10	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
11	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
12	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
13	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
14	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
15	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
16	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
17	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
18	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
	N = 17			N = 11			N = 39			N = 88		
	MEAN = 1.56			MEAN = 0.56			MEAN = 0.34			MEAN = 0.18		
	STD DEV = 2.44			STD DEV = 0.71			STD DEV = 0.63			STD DEV = 0.27		

DISTRIBUTION FUNCTIONS FOR TOTAL TRIP TIME
LA GAS:

MINUTES	COLD START FREQ.	COLD START DENS.	COLD START DIST.	WARM START FREQ.	WARM START DENS.	WARM START DIST.	NORMAL START FREQ.	NORMAL START DENS.	NORMAL START DIST.	HOT START FREQ.	HOT START DENS.	HOT START DIST.
0	0	0.0	0.0	0	0.0	0.0	1	2.56	2.56	3	3.41	3.41
1	3	17.65	17.65	0	0.0	0.0	1	2.56	5.13	8	9.09	12.50
2	0	0.0	17.65	0	0.0	0.0	5	12.82	17.95	4	4.55	17.05
3	1	5.88	23.53	0	0.0	0.0	2	5.13	23.08	7	7.95	25.00
4	0	0.0	23.53	0	0.0	0.0	2	5.13	28.21	7	7.95	32.95
5	0	0.0	23.53	0	0.0	0.0	1	2.56	30.77	4	4.55	37.50
6	0	0.0	23.53	0	0.0	0.0	3	7.69	38.46	8	9.09	46.59
7	1	5.88	29.41	2	18.18	18.18	3	7.69	46.15	1	1.14	47.73
8	0	0.0	29.41	0	0.0	18.18	1	2.56	48.72	0	0.0	47.73
9	0	0.0	29.41	2	18.18	36.36	4	10.26	58.97	2	2.27	50.00
10	1	5.88	35.29	1	9.09	45.45	2	5.13	64.10	1	1.14	51.14
12	2	11.76	47.06	1	9.09	54.55	1	2.56	66.67	4	4.55	55.68
14	0	0.0	47.06	1	9.09	63.64	2	5.13	71.79	4	4.55	60.23
16	0	0.0	47.06	0	0.0	63.64	2	5.13	76.92	3	3.41	63.64
18	0	0.0	47.06	0	0.0	63.64	0	0.0	76.92	5	5.68	69.32
20	1	5.88	52.94	0	0.0	63.64	0	0.0	76.92	2	2.27	71.59
22	0	0.0	52.94	0	0.0	63.64	0	0.0	76.92	1	1.14	72.73
24	0	0.0	52.94	0	0.0	63.64	1	2.56	79.49	3	3.41	76.14
26	1	5.88	58.82	0	0.0	63.64	0	0.0	79.49	0	0.0	76.14
28	0	0.0	58.82	0	0.0	63.64	1	2.56	82.05	1	1.14	77.27
30	0	0.0	58.82	0	0.0	63.64	0	0.0	82.05	2	2.27	79.55
32	0	0.0	58.82	1	9.09	72.73	1	2.56	84.62	1	1.14	80.68
34	0	0.0	58.82	1	9.09	81.82	2	5.13	89.74	1	1.14	81.82
36	1	5.88	64.71	0	0.0	81.82	0	0.0	89.74	1	1.14	82.95
38	0	0.0	64.71	0	0.0	81.82	1	2.56	92.31	1	1.14	84.09
40	0	0.0	64.71	0	0.0	81.82	0	0.0	92.31	1	1.14	85.23
42	1	5.88	70.59	0	0.0	81.82	0	0.0	92.31	1	1.14	86.36
44	1	5.88	76.47	0	0.0	81.82	1	2.56	94.87	0	0.0	86.36
46	2	11.76	88.24	0	0.0	81.82	0	0.0	94.87	1	1.14	87.50
48	0	0.0	88.24	0	0.0	81.82	0	0.0	94.87	1	1.14	88.64
50	0	0.0	88.24	0	0.0	81.82	0	0.0	94.87	1	1.14	89.77
52	0	0.0	88.24	0	0.0	81.82	0	0.0	94.87	0	0.0	89.77
54	0	0.0	88.24	0	0.0	81.82	0	0.0	94.87	1	1.14	90.91
56	0	0.0	88.24	0	0.0	81.82	1	2.56	97.44	0	0.0	90.91
58	0	0.0	88.24	0	0.0	81.82	0	0.0	97.44	1	1.14	92.05
60	1	5.88	94.12	1	9.09	90.91	1	2.56	100.00	4	4.55	96.59
90	1	5.88	100.00	0	0.0	90.91	0	0.0	100.00	0	0.0	96.59
120	0	0.0	100.00	1	9.09	100.00	0	0.0	100.00	2	2.27	98.86
150	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	98.86
180	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	1	1.14	100.00
210	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
240	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
270	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
300	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
330	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
360	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
390	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
420	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
	N = 17			N = 11			N = 39			N = 88		
	MEAN = 28.14			MEAN = 31.70			MEAN = 14.46			MEAN = 20.75		
	STD DEV = 28.25			STD DEV = 41.54			STD DEV = 15.79			STD DEV = 29.89		

DISTRIBUTION FUNCTIONS FOR ENGINE-OFF TIME
LA GAS:

MINUTES	COLD START FREQ.	COLD START DENS.	COLD START DIST.	WARM START FREQ.	WARM START DENS.	WARM START DIST.	NORMAL START FREQ.	NORMAL START DENS.	NORMAL START DIST.	HOT START FREQ.	HOT START DENS.	HOT START DIST.
1	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
2	1	50.00	50.00	0	0.0	0.0	6	15.38	15.38	5	5.68	5.68
3	0	0.0	50.00	0	0.0	0.0	1	2.56	17.95	6	6.82	12.50
4	0	0.0	50.00	0	0.0	0.0	2	5.13	23.08	8	9.09	21.59
5	0	0.0	50.00	0	0.0	0.0	1	2.56	25.64	7	7.95	29.55
6	0	0.0	50.00	0	0.0	0.0	1	2.56	28.21	4	4.55	34.09
7	0	0.0	50.00	0	0.0	0.0	0	0.0	28.21	4	4.55	38.64
8	0	0.0	50.00	0	0.0	0.0	0	0.0	28.21	6	6.82	45.45
9	0	0.0	50.00	0	0.0	0.0	0	0.0	28.21	4	4.55	50.00
10	0	0.0	50.00	0	0.0	0.0	0	0.0	28.21	1	1.14	51.14
11	0	0.0	50.00	0	0.0	0.0	1	2.56	30.77	4	4.55	55.68
12	0	0.0	50.00	0	0.0	0.0	0	0.0	30.77	3	3.41	59.09
13	0	0.0	50.00	0	0.0	0.0	0	0.0	30.77	4	4.55	63.64
14	0	0.0	50.00	0	0.0	0.0	1	2.56	33.33	6	6.82	70.45
15	0	0.0	50.00	0	0.0	0.0	0	0.0	33.33	2	2.27	72.73
20	0	0.0	50.00	1	9.09	9.09	3	7.69	41.03	8	9.09	81.82
25	0	0.0	50.00	1	9.09	18.18	4	10.26	51.28	6	6.82	88.64
30	0	0.0	50.00	1	9.09	27.27	6	15.38	66.67	4	4.55	93.18
35	0	0.0	50.00	0	0.0	27.27	3	7.69	74.36	2	2.27	95.45
40	0	0.0	50.00	1	9.09	36.36	1	2.56	76.92	0	0.0	95.45
45	0	0.0	50.00	2	18.18	54.55	2	5.13	82.05	1	1.14	96.59
50	0	0.0	50.00	0	0.0	54.55	0	0.0	82.05	2	2.27	98.86
55	0	0.0	50.00	0	0.0	54.55	4	10.26	92.31	0	0.0	98.86
60	0	0.0	50.00	0	0.0	54.55	0	0.0	92.31	0	0.0	98.86
65	1	50.00	100.00	0	0.0	54.55	0	0.0	92.31	0	0.0	98.86
70	0	0.0	100.00	0	0.0	54.55	1	2.56	94.87	1	1.14	100.00
75	0	0.0	100.00	0	0.0	54.55	1	2.56	97.44	0	0.0	100.00
80	0	0.0	100.00	0	0.0	54.55	0	0.0	97.44	0	0.0	100.00
85	0	0.0	100.00	0	0.0	54.55	0	0.0	97.44	0	0.0	100.00
90	0	0.0	100.00	0	0.0	54.55	0	0.0	97.44	0	0.0	100.00
95	0	0.0	100.00	1	9.09	63.64	0	0.0	97.44	0	0.0	100.00
100	0	0.0	100.00	1	9.09	72.73	0	0.0	97.44	0	0.0	100.00
105	0	0.0	100.00	0	0.0	72.73	0	0.0	97.44	0	0.0	100.00
110	0	0.0	100.00	1	9.09	81.82	1	2.56	100.00	0	0.0	100.00
115	0	0.0	100.00	0	0.0	81.82	0	0.0	100.00	0	0.0	100.00
120	0	0.0	100.00	0	0.0	81.82	0	0.0	100.00	0	0.0	100.00
135	0	0.0	100.00	0	0.0	81.82	0	0.0	100.00	0	0.0	100.00
180	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
195	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
210	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
225	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
240	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
270	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
300	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
330	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
360	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
ABOVE 360	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
	N = 2			N = 11			N = 39			N = 88		
	MEAN = 32.50			MEAN = 76.91			MEAN = 28.23			MEAN = 13.65		
	STD DEV = 43.13			STD DEV = 56.14			STD DEV = 24.05			STD DEV = 12.34		

Reproduced from best available copy.

DISTRIBUTION FUNCTIONS FOR INITIAL IDLE TIME
NY GAS:

SECONDS	COLD START FREQ.	COLD START DENS.	COLD START DIST.	WARM START FREQ.	WARM START DENS.	WARM START DIST.	NORMAL START FREQ.	NORMAL START DENS.	NORMAL START DIST.	HOT START FREQ.	HOT START DENS.	HOT START DIST.
0	3	30.00	30.00	0	0.0	0.0	2	9.09	9.09	1	1.61	1.61
2	1	10.00	40.00	1	25.00	25.00	1	4.55	13.64	11	17.74	19.35
4	0	0.0	40.00	0	0.0	25.00	3	13.64	27.27	18	29.03	48.39
6	0	0.0	40.00	0	0.0	25.00	2	9.09	36.36	7	11.29	59.68
8	0	0.0	40.00	0	0.0	25.00	0	0.0	36.36	3	4.84	64.52
10	0	0.0	40.00	0	0.0	25.00	2	9.09	45.45	5	8.06	72.58
12	1	10.00	50.00	0	0.0	25.00	3	13.64	59.09	1	1.61	74.19
14	0	0.0	50.00	0	0.0	25.00	0	0.0	59.09	2	3.23	77.42
16	1	10.00	60.00	1	25.00	50.00	2	9.09	68.18	2	3.23	80.65
18	0	0.0	60.00	0	0.0	50.00	0	0.0	68.18	0	0.0	80.65
20	0	0.0	60.00	0	0.0	50.00	0	0.0	68.18	1	1.61	82.26
22	0	0.0	60.00	0	0.0	50.00	1	4.55	72.73	0	0.0	82.26
24	0	0.0	60.00	0	0.0	50.00	0	0.0	72.73	0	0.0	82.26
26	0	0.0	60.00	1	25.00	75.00	0	0.0	72.73	1	1.61	83.87
28	0	0.0	60.00	0	0.0	75.00	0	0.0	72.73	0	0.0	83.87
30	0	0.0	60.00	0	0.0	75.00	0	0.0	72.73	0	0.0	83.87
32	0	0.0	60.00	0	0.0	75.00	0	0.0	72.73	0	0.0	83.87
34	0	0.0	60.00	0	0.0	75.00	0	0.0	72.73	0	0.0	83.87
36	0	0.0	60.00	0	0.0	75.00	0	0.0	72.73	1	1.61	85.48
38	0	0.0	60.00	0	0.0	75.00	1	4.55	77.27	0	0.0	85.48
40	0	0.0	60.00	0	0.0	75.00	0	0.0	77.27	0	0.0	85.48
42	0	0.0	60.00	0	0.0	75.00	0	0.0	77.27	0	0.0	85.48
44	0	0.0	60.00	0	0.0	75.00	0	0.0	77.27	1	1.61	87.10
46	0	0.0	60.00	0	0.0	75.00	0	0.0	77.27	1	1.61	88.71
48	1	10.00	70.00	0	0.0	75.00	0	0.0	77.27	0	0.0	88.71
50	0	0.0	70.00	0	0.0	75.00	0	0.0	77.27	1	1.61	90.32
52	0	0.0	70.00	0	0.0	75.00	0	0.0	77.27	0	0.0	90.32
54	0	0.0	70.00	0	0.0	75.00	0	0.0	77.27	0	0.0	90.32
56	0	0.0	70.00	0	0.0	75.00	0	0.0	77.27	0	0.0	90.32
58	0	0.0	70.00	0	0.0	75.00	0	0.0	77.27	0	0.0	90.32
1	0	0.0	70.00	0	0.0	75.00	2	9.09	86.36	3	4.84	95.16
2	0	0.0	70.00	1	25.00	100.00	1	4.55	90.91	0	0.0	95.16
3	0	0.0	70.00	0	0.0	100.00	0	0.0	90.91	2	3.23	98.39
4	1	10.00	80.00	0	0.0	100.00	1	4.55	95.45	0	0.0	98.39
5	1	10.00	90.00	0	0.0	100.00	0	0.0	95.45	0	0.0	98.39
6	0	0.0	90.00	0	0.0	100.00	0	0.0	95.45	0	0.0	98.39
7	1	10.00	100.00	0	0.0	100.00	0	0.0	95.45	0	0.0	98.39
8	0	0.0	100.00	0	0.0	100.00	0	0.0	95.45	1	1.61	100.00
9	0	0.0	100.00	0	0.0	100.00	0	0.0	95.45	0	0.0	100.00
10	0	0.0	100.00	0	0.0	100.00	0	0.0	95.45	0	0.0	100.00
11	0	0.0	100.00	0	0.0	100.00	0	0.0	95.45	0	0.0	100.00
12	0	0.0	100.00	0	0.0	100.00	0	0.0	95.45	0	0.0	100.00
13	0	0.0	100.00	0	0.0	100.00	1	4.55	100.00	0	0.0	100.00
14	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
15	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
16	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
17	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
18	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
	N = 10			N = 4			N = 22			N = 62		
	MEAN = 1.78			MEAN = 0.86			MEAN = 1.25			MEAN = 0.44		
	STD DEV = 2.69			STD DEV = 1.23			STD DEV = 3.00			STD DEV = 1.20		

DISTRIBUTION FUNCTIONS FOR TOTAL TRIP TIME
NY GAS:

MINUTES	COLD START FREQ.	COLD START DENS.	COLD START DIST.	WARM START FREQ.	WARM START DENS.	WARM START DIST.	NORMAL START FREQ.	NORMAL START DENS.	NORMAL START DIST.	HOT START FREQ.	HOT START DENS.	HOT START DIST.
0	0	0.0	0.0	0	0.0	0.0	1	4.55	4.55	2	3.23	3.23
1	0	0.0	0.0	0	0.0	0.0	1	4.55	9.09	7	11.29	14.52
2	0	0.0	0.0	0	0.0	0.0	1	4.55	13.64	3	4.84	19.35
3	0	0.0	0.0	2	50.00	50.00	0	0.0	13.64	1	1.61	20.97
4	0	0.0	0.0	0	0.0	50.00	0	0.0	13.64	4	6.45	27.42
5	0	0.0	0.0	1	25.00	75.00	1	4.55	18.18	3	4.84	32.26
6	1	10.00	10.00	0	0.0	75.00	1	4.55	22.73	1	1.61	33.87
7	0	0.0	10.00	0	0.0	75.00	0	0.0	22.73	2	3.23	37.10
8	0	0.0	10.00	0	0.0	75.00	2	9.09	31.82	4	6.45	43.55
9	0	0.0	10.00	0	0.0	75.00	0	0.0	31.82	2	3.23	46.77
10	0	0.0	10.00	0	0.0	75.00	1	4.55	36.36	5	8.06	54.84
12	1	10.00	20.00	0	0.0	75.00	1	4.55	40.91	8	12.90	67.74
14	0	0.0	20.00	0	0.0	75.00	0	0.0	40.91	2	3.23	70.97
16	0	0.0	20.00	0	0.0	75.00	0	0.0	40.91	3	4.84	75.81
18	0	0.0	20.00	0	0.0	75.00	0	0.0	40.91	2	3.23	79.03
20	0	0.0	20.00	0	0.0	75.00	0	0.0	40.91	2	3.23	82.26
22	0	0.0	20.00	1	25.00	100.00	1	4.55	45.45	0	0.0	82.26
24	1	10.00	30.00	0	0.0	100.00	0	0.0	45.45	1	1.61	83.87
26	0	0.0	30.00	0	0.0	100.00	0	0.0	45.45	1	1.61	85.48
28	0	0.0	30.00	0	0.0	100.00	1	4.55	50.00	1	1.61	87.10
30	0	0.0	30.00	0	0.0	100.00	0	0.0	50.00	0	0.0	87.10
32	0	0.0	30.00	0	0.0	100.00	0	0.0	50.00	0	0.0	87.10
34	0	0.0	30.00	0	0.0	100.00	1	4.55	54.55	0	0.0	87.10
36	0	0.0	30.00	0	0.0	100.00	0	0.0	54.55	0	0.0	87.10
38	0	0.0	30.00	0	0.0	100.00	0	0.0	54.55	2	3.23	90.32
40	1	10.00	40.00	0	0.0	100.00	0	0.0	54.55	1	1.61	91.94
42	0	0.0	40.00	0	0.0	100.00	0	0.0	54.55	0	0.0	91.94
44	0	0.0	40.00	0	0.0	100.00	0	0.0	54.55	2	3.23	95.16
46	0	0.0	40.00	0	0.0	100.00	0	0.0	54.55	0	0.0	95.16
48	0	0.0	40.00	0	0.0	100.00	1	4.55	59.09	0	0.0	95.16
50	0	0.0	40.00	0	0.0	100.00	0	0.0	59.09	1	1.61	96.77
52	0	0.0	40.00	0	0.0	100.00	0	0.0	59.09	0	0.0	96.77
54	0	0.0	40.00	0	0.0	100.00	0	0.0	59.09	1	1.61	98.39
56	0	0.0	40.00	0	0.0	100.00	0	0.0	59.09	1	1.61	100.00
58	0	0.0	40.00	0	0.0	100.00	0	0.0	59.09	0	0.0	100.00
60	1	10.00	50.00	0	0.0	100.00	2	9.09	68.18	0	0.0	100.00
90	1	10.00	60.00	0	0.0	100.00	4	18.18	86.36	0	0.0	100.00
120	0	0.0	60.00	0	0.0	100.00	1	4.55	90.91	0	0.0	100.00
150	3	30.00	90.00	0	0.0	100.00	1	4.55	95.45	0	0.0	100.00
180	0	0.0	90.00	0	0.0	100.00	0	0.0	95.45	0	0.0	100.00
210	0	0.0	90.00	0	0.0	100.00	1	4.55	100.00	0	0.0	100.00
240	1	10.00	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
270	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
300	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
330	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
360	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
390	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
420	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
	N = 10			N = 4			N = 22			N = 62		
	MEAN = 92.03			MEAN = 8.27			MEAN = 52.84			MEAN = 13.90		
	STD DEV = 78.39			STD DEV = 8.84			STD DEV = 57.76			STD DEV = 14.08		

Reproduced from best available copy.

DISTRIBUTION FUNCTIONS FOR ENGINE-OFF TIME
NY GAS:

MINUTES	COLD START FREQ.	COLD START DENS.	COLD START DIST.	WARM START FREQ.	WARM START DENS.	WARM START DIST.	NORMAL START FREQ.	NORMAL START DENS.	NORMAL START DIST.	HOT START FREQ.	HOT START DENS.	HOT START DIST.
1	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
2	0	0.0	0.0	0	0.0	0.0	2	9.09	9.09	4	6.45	6.45
3	0	0.0	0.0	0	0.0	0.0	2	9.09	18.18	4	6.45	12.90
4	0	0.0	0.0	1	25.00	25.00	0	0.0	18.18	4	6.45	19.35
5	0	0.0	0.0	0	0.0	25.00	0	0.0	18.18	7	11.29	30.65
6	0	0.0	0.0	0	0.0	25.00	0	0.0	18.18	7	11.29	41.94
7	0	0.0	0.0	0	0.0	25.00	0	0.0	18.18	7	11.29	53.23
8	0	0.0	0.0	0	0.0	25.00	0	0.0	18.18	2	3.23	56.45
9	0	0.0	0.0	0	0.0	25.00	0	0.0	18.18	1	1.61	58.06
10	0	0.0	0.0	0	0.0	25.00	0	0.0	18.18	3	4.84	62.90
11	0	0.0	0.0	0	0.0	25.00	0	0.0	18.18	2	3.23	66.13
12	0	0.0	0.0	0	0.0	25.00	1	4.55	22.73	4	6.45	72.58
13	0	0.0	0.0	0	0.0	25.00	0	0.0	22.73	6	9.68	82.26
14	0	0.0	0.0	0	0.0	25.00	1	4.55	27.27	0	0.0	82.26
15	0	0.0	0.0	0	0.0	25.00	0	0.0	27.27	4	6.45	88.71
20	0	0.0	0.0	0	0.0	25.00	1	4.55	31.82	4	6.45	95.16
25	0	0.0	0.0	0	0.0	25.00	3	13.64	45.45	2	3.23	98.39
30	0	0.0	0.0	0	0.0	25.00	1	4.55	50.00	1	1.61	100.00
35	0	0.0	0.0	1	25.00	50.00	0	0.0	50.00	0	0.0	100.00
40	0	0.0	0.0	0	0.0	50.00	5	22.73	72.73	0	0.0	100.00
45	0	0.0	0.0	0	0.0	50.00	0	0.0	72.73	0	0.0	100.00
50	0	0.0	0.0	0	0.0	50.00	0	0.0	72.73	0	0.0	100.00
55	0	0.0	0.0	0	0.0	50.00	1	4.55	77.27	0	0.0	100.00
60	0	0.0	0.0	1	25.00	75.00	1	4.55	81.82	0	0.0	100.00
65	0	0.0	0.0	0	0.0	75.00	1	4.55	86.36	0	0.0	100.00
70	0	0.0	0.0	0	0.0	75.00	0	0.0	86.36	0	0.0	100.00
75	0	0.0	0.0	0	0.0	75.00	1	4.55	90.91	0	0.0	100.00
80	0	0.0	0.0	0	0.0	75.00	1	4.55	95.45	0	0.0	100.00
85	0	0.0	0.0	0	0.0	75.00	0	0.0	95.45	0	0.0	100.00
90	0	0.0	0.0	0	0.0	75.00	0	0.0	95.45	0	0.0	100.00
95	0	0.0	0.0	0	0.0	75.00	0	0.0	95.45	0	0.0	100.00
100	0	0.0	0.0	0	0.0	75.00	0	0.0	95.45	0	0.0	100.00
105	0	0.0	0.0	1	25.00	100.00	0	0.0	95.45	0	0.0	100.00
110	0	0.0	0.0	0	0.0	100.00	0	0.0	95.45	0	0.0	100.00
115	0	0.0	0.0	0	0.0	100.00	0	0.0	95.45	0	0.0	100.00
120	0	0.0	0.0	0	0.0	100.00	0	0.0	95.45	0	0.0	100.00
135	0	0.0	0.0	0	0.0	100.00	0	0.0	95.45	0	0.0	100.00
150	0	0.0	0.0	0	0.0	100.00	0	0.0	95.45	0	0.0	100.00
165	0	0.0	0.0	0	0.0	100.00	0	0.0	95.45	0	0.0	100.00
180	0	0.0	0.0	0	0.0	100.00	0	0.0	95.45	0	0.0	100.00
195	0	0.0	0.0	0	0.0	100.00	0	0.0	95.45	0	0.0	100.00
210	0	0.0	0.0	0	0.0	100.00	0	0.0	95.45	0	0.0	100.00
225	0	0.0	0.0	0	0.0	100.00	0	0.0	95.45	0	0.0	100.00
240	0	0.0	0.0	0	0.0	100.00	0	0.0	95.45	0	0.0	100.00
270	0	0.0	0.0	0	0.0	100.00	0	0.0	95.45	0	0.0	100.00
300	0	0.0	0.0	0	0.0	100.00	0	0.0	95.45	0	0.0	100.00
330	0	0.0	0.0	0	0.0	100.00	0	0.0	95.45	0	0.0	100.00
360	0	0.0	0.0	0	0.0	100.00	0	0.0	95.45	0	0.0	100.00
ABOVE 360	0	0.0	0.0									
	N = 0			N = 4			N = 22			N = 62		
	MEAN = 0.0			MEAN = 54.25			MEAN = 28.14			MEAN = 9.35		
	STD DEV = 0.0			STD DEV = 44.92			STD DEV = 22.68			STD DEV = 6.07		

DISTRIBUTION FUNCTIONS FOR INITIAL IDLE TIME
LA DIESEL

SECONDS	COLD START FREQ.	COLD START DENS.	COLD START DIST.	WARM START FREQ.	WARM START DENS.	WARM START DIST.	NORMAL START FREQ.	NORMAL START DENS.	NORMAL START DIST.	HOT START FREQ.	HOT START DENS.	HOT START DIST.
0	3	20.00	20.00	2	10.53	10.53	0	0.0	0.0	0	0.0	0.0
2	0	0.0	20.00	1	5.26	15.79	1	3.85	3.85	0	0.0	0.0
4	0	0.0	20.00	2	10.53	26.32	5	19.23	23.08	0	0.0	0.0
6	1	6.67	26.67	5	26.32	52.63	7	26.92	50.00	0	0.0	0.0
8	0	0.0	26.67	0	0.0	52.63	0	0.0	50.00	0	0.0	0.0
10	0	0.0	26.67	1	5.26	57.89	3	11.54	61.54	0	0.0	0.0
12	1	6.67	33.33	1	5.26	63.16	0	0.0	61.54	0	0.0	0.0
14	0	0.0	33.33	0	0.0	63.16	2	7.69	69.23	0	0.0	0.0
16	0	0.0	33.33	0	0.0	63.16	3	11.54	80.77	0	0.0	0.0
18	0	0.0	33.33	1	5.26	68.42	1	3.85	84.62	0	0.0	0.0
20	1	6.67	40.00	1	5.26	73.68	0	0.0	84.62	0	0.0	0.0
22	0	0.0	40.00	0	0.0	73.68	0	0.0	84.62	0	0.0	0.0
24	0	0.0	40.00	0	0.0	73.68	0	0.0	84.62	0	0.0	0.0
26	1	6.67	46.67	0	0.0	73.68	1	3.85	88.46	0	0.0	0.0
28	0	0.0	46.67	0	0.0	73.68	0	0.0	88.46	0	0.0	0.0
30	0	0.0	46.67	0	0.0	73.68	0	0.0	88.46	0	0.0	0.0
32	0	0.0	46.67	1	5.26	78.95	0	0.0	88.46	0	0.0	0.0
34	0	0.0	46.67	0	0.0	78.95	0	0.0	88.46	0	0.0	0.0
36	0	0.0	46.67	0	0.0	78.95	0	0.0	88.46	0	0.0	0.0
38	0	0.0	46.67	1	5.26	84.21	0	0.0	88.46	0	0.0	0.0
40	1	6.67	53.33	0	0.0	84.21	1	3.85	92.31	0	0.0	0.0
42	0	0.0	53.33	0	0.0	84.21	0	0.0	92.31	0	0.0	0.0
44	0	0.0	53.33	0	0.0	84.21	0	0.0	92.31	0	0.0	0.0
46	0	0.0	53.33	0	0.0	84.21	0	0.0	92.31	0	0.0	0.0
48	0	0.0	53.33	0	0.0	84.21	0	0.0	92.31	0	0.0	0.0
50	0	0.0	53.33	0	0.0	84.21	0	0.0	92.31	0	0.0	0.0
52	0	0.0	53.33	0	0.0	84.21	0	0.0	92.31	0	0.0	0.0
54	0	0.0	53.33	0	0.0	84.21	0	0.0	92.31	0	0.0	0.0
56	0	0.0	53.33	0	0.0	84.21	0	0.0	92.31	0	0.0	0.0
58	0	0.0	53.33	0	0.0	84.21	0	0.0	92.31	0	0.0	0.0
1	1	6.67	60.00	3	15.79	100.00	2	7.69	100.00	0	0.0	0.0
2	1	6.67	66.67	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
3	1	6.67	73.33	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
4	1	6.67	80.00	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
5	0	0.0	80.00	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
6	1	6.67	86.67	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
7	1	6.67	93.33	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
8	0	0.0	93.33	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
9	0	0.0	93.33	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
10	0	0.0	93.33	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
11	0	0.0	93.33	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
12	0	0.0	93.33	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
13	0	0.0	93.33	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
14	0	0.0	93.33	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
15	1	6.67	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
16	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
17	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
18	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
	N = 15			N = 19			N = 26			N = 0		
	MEAN = 2.85			MEAN = 0.40			MEAN = 0.26			MEAN = 0.0		
	STD DEV = 4.19			STD DEV = 0.57			STD DEV = 0.32			STD DEV = 0.0		

DISTRIBUTION FUNCTIONS FOR TOTAL TRIP TIME
LA DIESEL

MINUTES	COLD START FREQ.	COLD START DENS.	COLD START DIST.	WARM START FREQ.	WARM START DENS.	WARM START DIST.	NORMAL START FREQ.	NORMAL START DENS.	NORMAL START DIST.	HOT START FREQ.	HOT START DENS.	HOT START DIST.
0	1	6.67	6.67	0	0.0	0.0	3	11.54	11.54	0	0.0	0.0
1	0	0.0	6.67	0	0.0	0.0	2	7.69	19.23	0	0.0	0.0
2	0	0.0	6.67	0	0.0	0.0	0	0.0	19.23	0	0.0	0.0
3	0	0.0	6.67	0	0.0	0.0	1	3.85	23.08	0	0.0	0.0
4	0	0.0	6.67	0	0.0	0.0	2	7.69	30.77	0	0.0	0.0
5	0	0.0	6.67	0	0.0	0.0	0	0.0	30.77	0	0.0	0.0
6	0	0.0	6.67	2	10.53	10.53	0	0.0	30.77	0	0.0	0.0
7	1	6.67	13.33	0	0.0	10.53	0	0.0	30.77	0	0.0	0.0
8	0	0.0	13.33	0	0.0	10.53	1	3.85	34.62	0	0.0	0.0
9	0	0.0	13.33	0	0.0	10.53	0	0.0	34.62	0	0.0	0.0
10	0	0.0	13.33	0	0.0	10.53	0	0.0	34.62	0	0.0	0.0
12	0	0.0	13.33	0	0.0	10.53	1	3.85	38.46	0	0.0	0.0
14	0	0.0	13.33	0	0.0	10.53	0	0.0	38.46	0	0.0	0.0
16	0	0.0	13.33	0	0.0	10.53	0	0.0	38.46	0	0.0	0.0
18	0	0.0	13.33	1	5.26	15.79	1	3.85	42.31	0	0.0	0.0
20	0	0.0	13.33	0	0.0	15.79	0	0.0	42.31	0	0.0	0.0
22	0	0.0	13.33	0	0.0	15.79	0	0.0	42.31	0	0.0	0.0
24	0	0.0	13.33	1	5.26	21.05	1	3.85	46.15	0	0.0	0.0
26	0	0.0	13.33	0	0.0	21.05	0	0.0	46.15	0	0.0	0.0
28	0	0.0	13.33	0	0.0	21.05	0	0.0	46.15	0	0.0	0.0
30	0	0.0	13.33	2	10.53	31.58	0	0.0	46.1	0	0.0	0.0
32	1	6.67	20.00	1	5.26	36.84	1	3.85	50.00	0	0.0	0.0
34	0	0.0	20.00	1	5.26	42.11	0	0.0	50.00	0	0.0	0.0
36	0	0.0	20.00	0	0.0	42.11	0	0.0	50.00	0	0.0	0.0
38	1	6.67	26.67	0	0.0	42.11	0	0.0	50.00	0	0.0	0.0
40	0	0.0	26.67	1	5.26	47.37	1	3.85	53.85	0	0.0	0.0
42	0	0.0	26.67	0	0.0	47.37	0	0.0	53.85	0	0.0	0.0
44	0	0.0	26.67	0	0.0	47.37	0	0.0	53.85	0	0.0	0.0
46	1	6.67	33.33	0	0.0	47.37	0	0.0	53.85	0	0.0	0.0
48	0	0.0	33.33	1	5.26	52.63	1	3.85	57.69	0	0.0	0.0
50	3	20.00	53.33	0	0.0	52.63	1	3.85	61.54	0	0.0	0.0
52	0	0.0	53.33	2	10.53	63.16	1	3.85	65.38	0	0.0	0.0
54	0	0.0	53.33	0	0.0	63.16	0	0.0	65.38	0	0.0	0.0
56	1	6.67	60.00	1	5.26	68.42	0	0.0	65.38	0	0.0	0.0
58	0	0.0	60.00	0	0.0	68.42	0	0.0	65.38	0	0.0	0.0
60	0	0.0	60.00	3	15.79	84.21	3	11.54	76.92	0	0.0	0.0
90	1	6.67	66.67	1	5.26	89.47	2	7.69	84.62	0	0.0	0.0
120	0	0.0	66.67	0	0.0	89.47	0	0.0	84.62	0	0.0	0.0
150	2	13.33	80.00	2	10.53	100.00	2	7.69	92.31	0	0.0	0.0
180	1	6.67	86.67	0	0.0	100.00	0	0.0	92.31	0	0.0	0.0
210	1	6.67	93.33	0	0.0	100.00	1	3.85	96.15	0	0.0	0.0
240	0	0.0	93.33	0	0.0	100.00	1	3.85	100.00	0	0.0	0.0
270	0	0.0	93.33	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
300	0	0.0	93.33	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
330	1	6.67	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
360	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
390	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
420	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
	N = 15			N = 19			N = 26			N = 0		
	MEAN = 98.14			MEAN = 52.82			MEAN = 54.63			MEAN = 0.0		
	STD DEV = 91.97			STD DEV = 40.06			STD DEV = 66.36			STD DEV = 0.0		

DISTRIBUTION FUNCTIONS FOR ENGINE-OFF TIME
LA DIESEL:

MINUTES	COLD START FREQ.	COLD START DENS.	COLD START DIST.	WARM START FREQ.	WARM START DENS.	WARM START DIST.	NORMAL START FREQ.	NORMAL START DENS.	NORMAL START DIST.	HOT START FREQ.	HOT START DENS.	HOT START DIST.
1	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
2	0	0.0	0.0	0	0.0	0.0	3	11.54	11.54	0	0.0	0.0
3	0	0.0	0.0	0	0.0	0.0	0	0.0	11.54	0	0.0	0.0
4	0	0.0	0.0	0	0.0	0.0	1	3.85	15.38	0	0.0	0.0
5	0	0.0	0.0	1	5.26	5.26	1	3.85	19.23	0	0.0	0.0
6	0	0.0	0.0	2	10.53	15.79	2	7.69	26.92	0	0.0	0.0
7	0	0.0	0.0	0	0.0	15.79	1	3.85	30.77	0	0.0	0.0
8	0	0.0	0.0	0	0.0	15.79	0	0.0	30.77	0	0.0	0.0
9	0	0.0	0.0	0	0.0	15.79	2	7.69	38.46	0	0.0	0.0
10	0	0.0	0.0	0	0.0	15.79	3	11.54	50.00	0	0.0	0.0
11	0	0.0	0.0	0	0.0	15.79	2	7.69	57.69	0	0.0	0.0
12	0	0.0	0.0	0	0.0	15.79	1	3.85	61.54	0	0.0	0.0
13	0	0.0	0.0	1	5.26	21.05	0	0.0	61.54	0	0.0	0.0
14	0	0.0	0.0	1	5.26	26.32	2	7.69	69.23	0	0.0	0.0
15	0	0.0	0.0	0	0.0	26.32	0	0.0	69.23	0	0.0	0.0
20	1	33.33	33.33	0	0.0	26.32	0	0.0	69.23	0	0.0	0.0
25	0	0.0	33.33	1	5.26	31.58	1	3.85	73.08	0	0.0	0.0
30	0	0.0	33.33	1	5.26	36.84	2	7.69	80.77	0	0.0	0.0
35	0	0.0	33.33	0	0.0	36.84	1	3.85	84.62	0	0.0	0.0
40	1	33.33	66.67	3	15.79	52.63	1	3.85	88.46	0	0.0	0.0
45	0	0.0	66.67	1	5.26	57.89	1	3.85	92.31	0	0.0	0.0
50	0	0.0	66.67	0	0.0	57.89	1	3.85	96.15	0	0.0	0.0
55	0	0.0	66.67	0	0.0	57.89	0	0.0	96.15	0	0.0	0.0
60	0	0.0	66.67	0	0.0	57.89	0	0.0	96.15	0	0.0	0.0
65	0	0.0	66.67	1	5.26	63.16	1	3.85	100.00	0	0.0	0.0
70	0	0.0	66.67	0	0.0	63.16	0	0.0	100.00	0	0.0	0.0
75	0	0.0	66.67	0	0.0	63.16	0	0.0	100.00	0	0.0	0.0
80	0	0.0	66.67	2	10.53	73.68	0	0.0	100.00	0	0.0	0.0
85	0	0.0	66.67	0	0.0	73.68	0	0.0	100.00	0	0.0	0.0
90	0	0.0	66.67	0	0.0	73.68	0	0.0	100.00	0	0.0	0.0
95	0	0.0	66.67	1	5.26	78.95	0	0.0	100.00	0	0.0	0.0
100	0	0.0	66.67	0	0.0	78.95	0	0.0	100.00	0	0.0	0.0
105	0	0.0	66.67	0	0.0	78.95	0	0.0	100.00	0	0.0	0.0
110	0	0.0	66.67	0	0.0	78.95	0	0.0	100.00	0	0.0	0.0
115	0	0.0	66.67	0	0.0	78.95	0	0.0	100.00	0	0.0	0.0
120	0	0.0	66.67	1	5.26	84.21	0	0.0	100.00	0	0.0	0.0
135	0	0.0	66.67	1	5.26	89.47	0	0.0	100.00	0	0.0	0.0
150	0	0.0	66.67	1	5.26	94.74	0	0.0	100.00	0	0.0	0.0
165	0	0.0	66.67	0	0.0	94.74	0	0.0	100.00	0	0.0	0.0
180	0	0.0	66.67	0	0.0	94.74	0	0.0	100.00	0	0.0	0.0
195	0	0.0	66.67	1	5.26	100.00	0	0.0	100.00	0	0.0	0.0
210	0	0.0	66.67	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
225	0	0.0	66.67	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
240	0	0.0	66.67	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
270	0	0.0	66.67	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
300	0	0.0	66.67	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
330	0	0.0	66.67	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
360	0	0.0	66.67	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
ABOVE 360	1	33.33	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	0.0
	N = 3			N = 19			N = 26			N = 0		
	MEAN = 167.33			MEAN = 62.63			MEAN = 17.81			MEAN = 0.0		
	STD DEV = 241.54			STD DEV = 56.06			STD DEV = 16.88			STD DEV = 0.0		

DISTRIBUTION FUNCTIONS FOR INITIAL IDLE TIME
NY DIESEL:

SECONDS	COLD START FREQ.	COLD START DENS.	COLD START DIST.	WARM START FREQ.	WARM START DENS.	WARM START DIST.	NORMAL START FREQ.	NORMAL START DENS.	NORMAL START DIST.	HOT START FREQ.	HOT START DENS.	HOT START DIST.
0	3	50.00	50.00	1	33.33	33.33	0	0.0	0.0	1	100.00	100.00
2	2	33.33	83.33	0	0.0	33.33	0	0.0	0.0	0	0.0	100.00
4	0	0.0	83.33	0	0.0	33.33	0	0.0	0.0	0	0.0	100.00
6	0	0.0	83.33	1	33.33	66.67	3	33.33	33.33	0	0.0	100.00
8	0	0.0	83.33	0	0.0	66.67	2	22.22	55.56	0	0.0	100.00
10	0	0.0	83.33	0	0.0	66.67	0	0.0	55.56	0	0.0	100.00
12	1	16.67	100.00	0	0.0	66.67	0	0.0	55.56	0	0.0	100.00
14	0	0.0	100.00	0	0.0	66.67	0	0.0	55.56	0	0.0	100.00
16	0	0.0	100.00	0	0.0	66.67	0	0.0	55.56	0	0.0	100.00
18	0	0.0	100.00	0	0.0	66.67	0	0.0	55.56	0	0.0	100.00
20	0	0.0	100.00	0	0.0	66.67	0	0.0	55.56	0	0.0	100.00
22	0	0.0	100.00	0	0.0	66.67	1	11.11	66.67	0	0.0	100.00
24	0	0.0	100.00	0	0.0	66.67	1	11.11	77.78	0	0.0	100.00
26	0	0.0	100.00	0	0.0	66.67	0	0.0	77.78	0	0.0	100.00
28	0	0.0	100.00	1	33.33	100.00	0	0.0	77.78	0	0.0	100.00
30	0	0.0	100.00	0	0.0	100.00	0	0.0	77.78	0	0.0	100.00
32	0	0.0	100.00	0	0.0	100.00	0	0.0	77.78	0	0.0	100.00
34	0	0.0	100.00	0	0.0	100.00	0	0.0	77.78	0	0.0	100.00
36	0	0.0	100.00	0	0.0	100.00	0	0.0	77.78	0	0.0	100.00
38	0	0.0	100.00	0	0.0	100.00	0	0.0	77.78	0	0.0	100.00
40	0	0.0	100.00	0	0.0	100.00	0	0.0	77.78	0	0.0	100.00
42	0	0.0	100.00	0	0.0	100.00	0	0.0	77.78	0	0.0	100.00
44	0	0.0	100.00	0	0.0	100.00	0	0.0	77.78	0	0.0	100.00
46	0	0.0	100.00	0	0.0	100.00	0	0.0	77.78	0	0.0	100.00
48	0	0.0	100.00	0	0.0	100.00	0	0.0	77.78	0	0.0	100.00
50	0	0.0	100.00	0	0.0	100.00	0	0.0	77.78	0	0.0	100.00
52	0	0.0	100.00	0	0.0	100.00	1	11.11	88.89	0	0.0	100.00
54	0	0.0	100.00	0	0.0	100.00	0	0.0	88.89	0	0.0	100.00
56	0	0.0	100.00	0	0.0	100.00	1	11.11	100.00	0	0.0	100.00
58	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
1	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
2	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
3	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
4	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
5	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
6	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
7	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
8	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
10	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
11	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
12	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
13	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
14	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
15	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
16	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
17	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
18	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
	N = 6			N = 3			N = 9			N = 1		
	MEAN = 0.05			MEAN = 0.20			MEAN = 0.34			MEAN = 0.0		
	STD DEV = 0.08			STD DEV = 0.23			STD DEV = 0.33			STD DEV = 0.0		

DISTRIBUTION FUNCTIONS FOR TOTAL TRIP TIME
NY DIESEL:

MINUTES	COLD START FREQ.	COLD START DENS.	COLD START DIST.	WARM START FREQ.	WARM START DENS.	WARM START DIST.	NORMAL START FREQ.	NORMAL START DENS.	NORMAL START DIST.	HOT START FREQ.	HOT START DENS.	HOT START DIST.
0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
1	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
2	1	16.67	16.67	1	33.33	33.33	0	0.0	0.0	0	0.0	0.0
3	0	0.0	16.67	0	0.0	33.33	0	0.0	0.0	0	0.0	0.0
4	0	0.0	16.67	0	0.0	33.33	0	0.0	0.0	0	0.0	0.0
5	0	0.0	16.67	0	0.0	33.33	0	0.0	0.0	0	0.0	0.0
6	0	0.0	16.67	0	0.0	33.33	0	0.0	0.0	0	0.0	0.0
7	0	0.0	16.67	0	0.0	33.33	0	0.0	0.0	0	0.0	0.0
8	0	0.0	16.67	0	0.0	33.33	1	11.11	11.11	0	0.0	0.0
9	0	0.0	16.67	0	0.0	33.33	0	0.0	11.11	0	0.0	0.0
10	0	0.0	16.67	0	0.0	33.33	0	0.0	11.11	0	0.0	0.0
12	0	0.0	16.67	0	0.0	33.33	0	0.0	11.11	0	0.0	0.0
14	0	0.0	16.67	0	0.0	33.33	0	0.0	11.11	0	0.0	0.0
16	0	0.0	16.67	0	0.0	33.33	0	0.0	11.11	0	0.0	0.0
18	0	0.0	16.67	0	0.0	33.33	0	0.0	11.11	0	0.0	0.0
20	0	0.0	16.67	0	0.0	33.33	1	11.11	22.22	0	0.0	0.0
22	1	16.67	33.33	1	33.33	66.67	0	0.0	22.22	0	0.0	0.0
24	0	0.0	33.33	0	0.0	66.67	0	0.0	22.22	0	0.0	0.0
26	0	0.0	33.33	0	0.0	66.67	0	0.0	22.22	0	0.0	0.0
28	0	0.0	33.33	0	0.0	66.67	0	0.0	22.22	0	0.0	0.0
30	0	0.0	33.33	0	0.0	66.67	0	0.0	22.22	0	0.0	0.0
32	0	0.0	33.33	0	0.0	66.67	0	0.0	22.22	0	0.0	0.0
34	0	0.0	33.33	0	0.0	66.67	0	0.0	22.22	0	0.0	0.0
36	0	0.0	33.33	0	0.0	66.67	0	0.0	22.22	0	0.0	0.0
38	0	0.0	33.33	0	0.0	66.67	0	0.0	22.22	0	0.0	0.0
40	0	0.0	33.33	0	0.0	66.67	0	0.0	22.22	0	0.0	0.0
42	0	0.0	33.33	0	0.0	66.67	0	0.0	22.22	0	0.0	0.0
44	1	16.67	50.00	0	0.0	66.67	0	0.0	22.22	0	0.0	0.0
46	0	0.0	50.00	0	0.0	66.67	0	0.0	22.22	0	0.0	0.0
48	0	0.0	50.00	1	33.33	100.00	0	0.0	22.22	0	0.0	0.0
50	0	0.0	50.00	0	0.0	100.00	0	0.0	22.22	0	0.0	0.0
52	0	0.0	50.00	0	0.0	100.00	0	0.0	22.22	0	0.0	0.0
54	1	16.67	66.67	0	0.0	100.00	0	0.0	22.22	0	0.0	0.0
56	0	0.0	66.67	0	0.0	100.00	0	0.0	22.22	0	0.0	0.0
58	1	16.67	83.33	0	0.0	100.00	0	0.0	22.22	0	0.0	0.0
60	0	0.0	83.33	0	0.0	100.00	0	0.0	22.22	0	0.0	0.0
90	0	0.0	83.33	0	0.0	100.00	0	0.0	22.22	1	100.00	100.00
120	0	0.0	83.33	0	0.0	100.00	4	44.44	66.67	0	0.0	100.00
150	0	0.0	83.33	0	0.0	100.00	1	11.11	77.78	0	0.0	100.00
180	0	0.0	83.33	0	0.0	100.00	0	0.0	77.78	0	0.0	100.00
210	0	0.0	83.33	0	0.0	100.00	1	11.11	88.89	0	0.0	100.00
240	1	16.67	100.00	0	0.0	100.00	0	0.0	88.89	0	0.0	100.00
270	0	0.0	100.00	0	0.0	100.00	0	0.0	88.89	0	0.0	100.00
300	0	0.0	100.00	0	0.0	100.00	0	0.0	88.89	0	0.0	100.00
330	0	0.0	100.00	0	0.0	100.00	0	0.0	88.89	0	0.0	100.00
360	0	0.0	100.00	0	0.0	100.00	0	0.0	88.89	0	0.0	100.00
390	0	0.0	100.00	0	0.0	100.00	1	11.11	100.00	0	0.0	100.00
420	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
	N = 6			N = 3			N = 9			N = 1		
	MEAN = 67.83			MEAN = 23.54			MEAN = 138.20			MEAN = 0.0		
	STD DEV = 80.85			STD DEV = 22.91			STD DEV = 112.83			STD DEV = 0.0		

DISTRIBUTION FUNCTIONS FOR ENGINE-OFF TIME
NY DIESEL

MINUTES	COLD START FREQ.	COLD START DENS.	COLD START DIST.	WARM START FREQ.	WARM START DENS.	WARM START DIST.	NORMAL START FREQ.	NORMAL START DENS.	NORMAL START DIST.	HOT START FREQ.	HOT START DENS.	HOT START DIST.
1	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
2	0	0.0	0.0	1	33.33	33.33	0	0.0	0.0	0	0.0	0.0
3	0	0.0	0.0	0	0.0	33.33	0	0.0	0.0	0	0.0	0.0
4	0	0.0	0.0	0	0.0	33.33	0	0.0	0.0	0	0.0	0.0
5	1	100.00	100.00	0	0.0	33.33	2	22.22	22.22	0	0.0	0.0
6	0	0.0	100.00	0	0.0	33.33	0	0.0	22.22	0	0.0	0.0
7	0	0.0	100.00	0	0.0	33.33	0	0.0	22.22	0	0.0	0.0
8	0	0.0	100.00	0	0.0	33.33	0	0.0	22.22	0	0.0	0.0
9	0	0.0	100.00	0	0.0	33.33	1	11.11	33.33	0	0.0	0.0
10	0	0.0	100.00	0	0.0	33.33	0	0.0	33.33	0	0.0	0.0
11	0	0.0	100.00	0	0.0	33.33	1	11.11	44.44	0	0.0	0.0
12	0	0.0	100.00	0	0.0	33.33	0	0.0	44.44	0	0.0	0.0
13	0	0.0	100.00	0	0.0	33.33	0	0.0	44.44	0	0.0	0.0
14	0	0.0	100.00	0	0.0	33.33	1	11.11	55.56	0	0.0	0.0
15	0	0.0	100.00	0	0.0	33.33	0	0.0	55.56	0	0.0	0.0
20	0	0.0	100.00	0	0.0	33.33	1	11.11	66.67	1	100.00	100.00
25	0	0.0	100.00	0	0.0	33.33	1	11.11	77.78	0	0.0	100.00
30	0	0.0	100.00	0	0.0	33.33	0	0.0	77.78	0	0.0	100.00
35	0	0.0	100.00	0	0.0	33.33	1	11.11	88.89	0	0.0	100.00
40	0	0.0	100.00	0	0.0	33.33	0	0.0	88.89	0	0.0	100.00
45	0	0.0	100.00	0	0.0	33.33	0	0.0	88.89	0	0.0	100.00
50	0	0.0	100.00	0	0.0	33.33	0	0.0	88.89	0	0.0	100.00
55	0	0.0	100.00	0	0.0	33.33	1	11.11	100.00	0	0.0	100.00
60	0	0.0	100.00	0	0.0	33.33	0	0.0	100.00	0	0.0	100.00
65	0	0.0	100.00	0	0.0	33.33	0	0.0	100.00	0	0.0	100.00
70	0	0.0	100.00	0	0.0	33.33	0	0.0	100.00	0	0.0	100.00
75	0	0.0	100.00	0	0.0	33.33	0	0.0	100.00	0	0.0	100.00
80	0	0.0	100.00	0	0.0	33.33	0	0.0	100.00	0	0.0	100.00
85	0	0.0	100.00	1	33.33	66.67	0	0.0	100.00	0	0.0	100.00
90	0	0.0	100.00	0	0.0	66.67	0	0.0	100.00	0	0.0	100.00
95	0	0.0	100.00	0	0.0	66.67	0	0.0	100.00	0	0.0	100.00
100	0	0.0	100.00	0	0.0	66.67	0	0.0	100.00	0	0.0	100.00
105	0	0.0	100.00	0	0.0	66.67	0	0.0	100.00	0	0.0	100.00
110	0	0.0	100.00	0	0.0	66.67	0	0.0	100.00	0	0.0	100.00
115	0	0.0	100.00	0	0.0	66.67	0	0.0	100.00	0	0.0	100.00
120	0	0.0	100.00	0	0.0	66.67	0	0.0	100.00	0	0.0	100.00
135	0	0.0	100.00	0	0.0	66.67	0	0.0	100.00	0	0.0	100.00
150	0	0.0	100.00	0	0.0	66.67	0	0.0	100.00	0	0.0	100.00
165	0	0.0	100.00	0	0.0	66.67	0	0.0	100.00	0	0.0	100.00
180	0	0.0	100.00	0	0.0	66.67	0	0.0	100.00	0	0.0	100.00
195	0	0.0	100.00	0	0.0	66.67	0	0.0	100.00	0	0.0	100.00
210	0	0.0	100.00	0	0.0	66.67	0	0.0	100.00	0	0.0	100.00
225	0	0.0	100.00	0	0.0	66.67	0	0.0	100.00	0	0.0	100.00
240	0	0.0	100.00	0	0.0	66.67	0	0.0	100.00	0	0.0	100.00
270	0	0.0	100.00	0	0.0	66.67	0	0.0	100.00	0	0.0	100.00
300	0	0.0	100.00	0	0.0	66.67	0	0.0	100.00	0	0.0	100.00
330	0	0.0	100.00	0	0.0	66.67	0	0.0	100.00	0	0.0	100.00
360	0	0.0	100.00	1	33.33	100.00	0	0.0	100.00			
ABOVE 360	0	0.0	100.00									
N	1			3			9			1		
MEAN	0.0			1657.00			20.22			0.0		
STD DEV	0.0			2791.54			16.15			0.0		

DISTRIBUTION FUNCTIONS FOR TOTAL TRIP TIME
ALL LA TRUCKS:

MINUTES	COLD START FREQ.	COLD START DENS.	COLD START DIST.	WARM START FREQ.	WARM START DENS.	WARM START DIST.	NORMAL START FREQ.	NORMAL START DENS.	NORMAL START DIST.	HOT START FREQ.	HOT START DENS.	HOT START DIST.
0	1	3.13	3.13	0	0.0	0.0	4	6.15	6.15	3	3.41	3.41
1	3	9.38	12.50	0	0.0	0.0	3	4.62	10.77	8	9.09	12.50
2	0	0.0	12.50	0	0.0	0.0	5	7.69	18.46	4	4.55	17.05
3	1	3.13	15.63	0	0.0	0.0	3	4.62	23.08	7	7.95	25.00
4	0	0.0	15.63	0	0.0	0.0	4	6.15	29.23	7	7.95	32.95
5	0	0.0	15.63	0	0.0	0.0	1	1.54	30.77	4	4.55	37.50
6	0	0.0	15.63	2	6.67	6.67	3	4.62	35.38	8	9.09	46.59
7	2	6.25	21.88	2	6.67	13.33	3	4.62	40.00	1	1.14	47.73
8	0	0.0	21.88	0	0.0	13.33	2	3.08	43.08	0	0.0	47.73
9	0	0.0	21.88	2	6.67	20.00	4	6.15	49.23	2	2.27	50.00
10	1	3.13	25.00	1	3.33	23.33	2	3.08	52.31	1	1.14	51.14
12	2	6.25	31.25	1	3.33	26.67	2	3.08	55.38	4	4.55	55.68
14	0	0.0	31.25	1	3.33	30.00	2	3.08	58.46	4	4.55	60.23
16	0	0.0	31.25	0	0.0	30.00	2	3.08	61.54	3	3.41	63.64
18	0	0.0	31.25	1	3.33	33.33	1	1.54	63.08	5	5.68	69.32
20	1	3.13	34.38	0	0.0	33.33	0	0.0	63.08	2	2.27	71.59
22	0	0.0	34.38	0	0.0	33.33	0	0.0	63.08	1	1.14	72.73
24	0	0.0	34.38	1	3.33	36.67	2	3.08	66.15	3	3.41	76.14
26	1	3.13	37.50	0	0.0	36.67	0	0.0	66.15	0	0.0	76.14
28	0	0.0	37.50	0	0.0	36.67	1	1.54	67.69	1	1.14	77.27
30	0	0.0	37.50	2	6.67	43.33	0	0.0	67.69	2	2.27	79.55
32	1	3.13	40.63	2	6.67	50.00	2	3.08	70.77	1	1.14	80.68
34	0	0.0	40.63	2	6.67	56.67	2	3.08	73.85	1	1.14	81.82
36	1	3.13	43.75	0	0.0	56.67	0	0.0	73.85	1	1.14	82.95
38	1	3.13	46.88	0	0.0	56.67	1	1.54	75.38	1	1.14	84.09
40	0	0.0	46.88	1	3.33	60.00	1	1.54	76.92	1	1.14	85.23
42	1	3.13	50.00	0	0.0	60.00	0	0.0	76.92	1	1.14	86.36
44	1	3.13	53.13	0	0.0	60.00	1	1.54	78.46	0	0.0	86.36
46	3	9.38	62.50	0	0.0	60.00	0	0.0	78.46	1	1.14	87.50
48	0	0.0	62.50	1	3.33	63.33	1	1.54	80.00	1	1.14	88.64
50	3	9.38	71.88	0	0.0	63.33	1	1.54	81.54	1	1.14	89.77
52	0	0.0	71.88	2	6.67	70.00	1	1.54	83.08	0	0.0	89.77
54	0	0.0	71.88	0	0.0	70.00	0	0.0	83.08	1	1.14	90.91
56	1	3.13	75.00	1	3.33	73.33	1	1.54	84.62	0	0.0	90.91
58	0	0.0	75.00	0	0.0	73.33	0	0.0	84.62	1	1.14	92.05
60	1	3.13	78.13	4	13.33	86.67	4	6.15	90.77	4	4.55	96.59
90	2	6.25	84.38	1	3.33	90.00	2	3.08	93.85	0	0.0	96.59
120	0	0.0	84.38	0	0.0	90.00	0	0.0	93.85	2	2.27	98.86
150	2	6.25	90.63	3	10.00	100.00	2	3.08	96.92	0	0.0	98.86
180	1	3.13	93.75	0	0.0	100.00	0	0.0	96.92	1	1.14	100.00
210	1	3.13	96.88	0	0.0	100.00	1	1.54	98.46	0	0.0	100.00
240	0	0.0	96.88	0	0.0	100.00	1	1.54	100.00	0	0.0	100.00
270	0	0.0	96.88	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
300	0	0.0	96.88	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
330	1	3.13	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
360	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
390	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
420	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
	N = 32			N = 30			N = 65			N = 88		
	MEAN = 60.95			MEAN = 45.07			MEAN = 30.53			MEAN = 20.75		
	STD DEV = 74.11			STD DEV = 41.21			STD DEV = 47.56			STD DEV = 29.89		

DISTRIBUTION FUNCTIONS FOR ENGINE-OFF TIME
ALL IA TRUCKS:

MINUTES	COLD START FREQ.	COLD START DENS.	COLD START DIST.	WARM START FREQ.	WARM START DENS.	WARM START DIST.	NORMAL START FREQ.	NORMAL START DENS.	NORMAL START DIST.	HOT START FREQ.	HOT START DENS.	HOT START DIST.
1	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
2	1	20.00	20.00	0	0.0	0.0	9	13.85	13.85	5	5.68	5.68
3	0	0.0	20.00	0	0.0	0.0	1	1.54	15.38	6	6.82	12.50
4	0	0.0	20.00	0	0.0	0.0	3	4.62	20.00	8	9.09	21.59
5	0	0.0	20.00	1	3.33	3.33	2	3.08	23.08	7	7.95	29.55
6	0	0.0	20.00	2	6.67	10.00	3	4.62	27.69	4	4.55	34.09
7	0	0.0	20.00	0	0.0	10.00	1	1.54	29.23	4	4.55	38.64
8	0	0.0	20.00	0	0.0	10.00	0	0.0	29.23	6	6.82	45.45
9	0	0.0	20.00	0	0.0	10.00	2	3.08	32.31	4	4.55	50.00
10	0	0.0	20.00	0	0.0	10.00	3	4.62	36.92	1	1.14	51.14
11	0	0.0	20.00	0	0.0	10.00	3	4.62	41.54	4	4.55	55.68
12	0	0.0	20.00	0	0.0	10.00	1	1.54	43.08	3	3.41	59.09
13	0	0.0	20.00	1	3.33	13.33	0	0.0	43.08	4	4.55	63.64
14	0	0.0	20.00	1	3.33	16.67	3	4.62	47.69	6	6.82	70.45
15	0	0.0	20.00	0	0.0	16.67	0	0.0	47.69	2	2.27	72.73
20	1	20.00	40.00	1	3.33	20.00	3	4.62	52.31	8	9.09	81.82
25	0	0.0	40.00	2	6.67	26.67	5	7.69	60.00	6	6.82	88.64
30	0	0.0	40.00	2	6.67	33.33	8	12.31	72.31	4	4.55	93.18
35	0	0.0	40.00	0	0.0	33.33	4	6.15	78.46	2	2.27	95.45
40	1	20.00	60.00	4	13.33	46.67	2	3.08	81.54	0	0.0	95.45
45	0	0.0	60.00	3	10.00	56.67	3	4.62	86.15	1	1.14	96.59
50	0	0.0	60.00	0	0.0	56.67	1	1.54	87.69	2	2.27	98.86
55	0	0.0	60.00	0	0.0	56.67	4	6.15	93.85	0	0.0	98.86
60	0	0.0	60.00	0	0.0	56.67	0	0.0	93.85	0	0.0	98.86
65	1	20.00	80.00	1	3.33	60.00	1	1.54	95.38	0	0.0	98.86
70	0	0.0	80.00	0	0.0	60.00	1	1.54	96.92	1	1.14	100.00
75	0	0.0	80.00	0	0.0	60.00	1	1.54	98.46	0	0.0	100.00
80	0	0.0	80.00	2	6.67	66.67	0	0.0	98.46	0	0.0	100.00
85	0	0.0	80.00	0	0.0	66.67	0	0.0	98.46	0	0.0	100.00
90	0	0.0	80.00	0	0.0	66.67	0	0.0	98.46	0	0.0	100.00
95	0	0.0	80.00	2	6.67	73.33	0	0.0	98.46	0	0.0	100.00
100	0	0.0	80.00	1	3.33	76.67	0	0.0	98.46	0	0.0	100.00
105	0	0.0	80.00	0	0.0	76.67	0	0.0	98.46	0	0.0	100.00
110	0	0.0	80.00	1	3.33	80.00	1	1.54	100.00	0	0.0	100.00
115	0	0.0	80.00	0	0.0	80.00	0	0.0	100.00	0	0.0	100.00
120	0	0.0	80.00	1	3.33	83.33	0	0.0	100.00	0	0.0	100.00
135	0	0.0	80.00	1	3.33	86.67	0	0.0	100.00	0	0.0	100.00
150	0	0.0	80.00	1	3.33	90.00	0	0.0	100.00	0	0.0	100.00
180	0	0.0	80.00	0	0.0	90.67	0	0.0	100.00	0	0.0	100.00
195	0	0.0	80.00	1	3.33	100.00	0	0.0	100.00	0	0.0	100.00
210	0	0.0	80.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
225	0	0.0	80.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
240	0	0.0	80.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
270	0	0.0	80.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
300	0	0.0	80.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
330	0	0.0	80.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
360	0	0.0	80.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
ABOVE 360	1	20.00	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
	N = 5			N = 30			N = 65			N = 88		
	MEAN = 113.40			MEAN = 67.87			MEAN = 24.06			MEAN = 13.65		
	STD DEV = 187.32			STD DEV = 55.56			STD DEV = 21.93			STD DEV = 12.34		

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DISTRIBUTION FUNCTIONS FOR INITIAL IDLE TIME
ALL MY TRUCKS:

SECONDS	COLD START FREQ.	COLD START DENS.	COLD START DIST.	WARM START FREQ.	WARM START DENS.	WARM START DIST.	NORMAL START FREQ.	NORMAL START DENS.	NORMAL START DIST.	HOT START FREQ.	HOT START DENS.	HOT START DIST.
0	6	37.50	37.50	1	14.29	14.29	2	6.45	6.45	2	3.17	3.17
2	3	18.75	56.25	1	14.29	28.57	1	3.23	9.68	11	17.46	20.63
4	0	0.0	56.25	0	0.0	28.57	3	9.68	19.35	18	28.57	49.21
6	0	0.0	56.25	1	14.29	42.86	5	16.13	35.48	7	11.11	60.32
8	0	0.0	56.25	0	0.0	42.86	2	6.45	41.94	3	4.76	65.08
10	0	0.0	56.25	0	0.0	42.86	2	6.45	48.39	5	7.94	73.02
12	2	12.50	68.75	0	0.0	42.86	3	9.68	58.06	1	1.59	74.60
14	0	0.0	68.75	0	0.0	42.86	0	0.0	58.06	2	3.17	77.78
16	1	6.25	75.00	1	14.29	57.14	2	6.45	64.52	2	3.17	80.95
18	0	0.0	75.00	0	0.0	57.14	0	0.0	64.52	0	0.0	80.95
20	0	0.0	75.00	0	0.0	57.14	0	0.0	64.52	1	1.59	82.54
22	0	0.0	75.00	0	0.0	57.14	2	6.45	70.97	0	0.0	82.54
24	0	0.0	75.00	0	0.0	57.14	1	3.23	74.19	0	0.0	82.54
26	0	0.0	75.00	1	14.29	71.43	0	0.0	74.19	1	1.59	84.13
28	0	0.0	75.00	1	14.29	85.71	0	0.0	74.19	0	0.0	84.13
30	0	0.0	75.00	0	0.0	85.71	0	0.0	74.19	0	0.0	84.13
32	0	0.0	75.00	0	0.0	85.71	0	0.0	74.19	0	0.0	84.13
34	0	0.0	75.00	0	0.0	85.71	0	0.0	74.19	0	0.0	84.13
36	0	0.0	75.00	0	0.0	85.71	0	0.0	74.19	1	1.59	85.71
38	0	0.0	75.00	0	0.0	85.71	1	3.23	77.42	0	0.0	85.71
40	0	0.0	75.00	0	0.0	85.71	0	0.0	77.42	0	0.0	85.71
42	0	0.0	75.00	0	0.0	85.71	0	0.0	77.42	0	0.0	85.71
44	0	0.0	75.00	0	0.0	85.71	0	0.0	77.42	1	1.59	87.30
46	0	0.0	75.00	0	0.0	85.71	0	0.0	77.42	1	1.59	88.89
48	1	6.25	81.25	0	0.0	85.71	0	0.0	77.42	0	0.0	88.89
50	0	0.0	81.25	0	0.0	85.71	1	3.23	80.65	1	1.59	90.48
52	0	0.0	81.25	0	0.0	85.71	0	0.0	80.65	0	0.0	90.48
54	0	0.0	81.25	0	0.0	85.71	1	3.23	83.87	0	0.0	90.48
56	0	0.0	81.25	0	0.0	85.71	0	0.0	83.87	0	0.0	90.48
58	0	0.0	81.25	0	0.0	85.71	0	0.0	83.87	0	0.0	90.48
1	0	0.0	81.25	0	0.0	85.71	2	6.45	90.32	3	4.76	95.24
2	0	0.0	81.25	1	14.29	100.00	1	3.23	93.55	0	0.0	95.24
3	0	0.0	81.25	0	0.0	100.00	0	0.0	93.55	2	3.17	98.41
4	1	6.25	87.50	0	0.0	100.00	1	3.23	96.77	0	0.0	98.41
5	1	6.25	93.75	0	0.0	100.00	0	0.0	96.77	0	0.0	98.41
6	0	0.0	93.75	0	0.0	100.00	0	0.0	96.77	0	0.0	98.41
7	1	6.25	100.00	0	0.0	100.00	0	0.0	96.77	0	0.0	98.41
8	0	0.0	100.00	0	0.0	100.00	0	0.0	96.77	1	1.59	100.00
9	0	0.0	100.00	0	0.0	100.00	0	0.0	96.77	0	0.0	100.00
10	0	0.0	100.00	0	0.0	100.00	0	0.0	96.77	0	0.0	100.00
11	0	0.0	100.00	0	0.0	100.00	0	0.0	96.77	0	0.0	100.00
12	0	0.0	100.00	0	0.0	100.00	0	0.0	96.77	0	0.0	100.00
13	0	0.0	100.00	0	0.0	100.00	1	3.23	100.00	0	0.0	100.00
14	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
15	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
16	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
17	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
18	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
	N = 16			N = 7			N = 31			N = 63		
	MEAN = 1.13			MEAN = 0.58			MEAN = 0.98			MEAN = 0.43		
	STD DEV = 2.25			STD DEV = 0.95			STD DEV = 2.55			STD DEV = 1.19		

DISTRIBUTION FUNCTIONS FOR TOTAL TRIP TIME
ALL NY TRUCKS:

MINUTES	COLD START FREQ.	COLD START DENS.	COLD START DIST.	WARM START FREQ.	WARM START DENS.	WARM START DIST.	NORMAL START FREQ.	NORMAL START DENS.	NORMAL START DIST.	HOT START FREQ.	HOT START DENS.	HOT START DIST.
0	0	0.0	0.0	0	0.0	0.0	1	3.23	3.23	2	3.17	3.17
1	0	0.0	0.0	0	0.0	0.0	1	3.23	6.45	7	11.11	14.29
2	1	6.25	6.25	1	14.29	14.29	1	3.23	9.68	3	4.76	19.05
3	0	0.0	6.25	2	28.57	42.86	0	0.0	9.68	1	1.59	20.63
4	0	0.0	6.25	0	0.0	42.86	0	0.0	9.68	4	6.35	26.98
5	0	0.0	6.25	1	14.29	57.14	1	3.23	12.90	3	4.76	31.75
6	1	6.25	12.50	0	0.0	57.14	1	3.23	16.13	1	1.59	33.33
7	0	0.0	12.50	0	0.0	57.14	0	0.0	16.13	2	3.17	36.51
8	0	0.0	12.50	0	0.0	57.14	3	9.68	25.81	4	6.35	42.86
9	0	0.0	12.50	0	0.0	57.14	0	0.0	25.81	2	3.17	46.03
10	0	0.0	12.50	0	0.0	57.14	1	3.23	29.03	5	7.94	53.97
12	1	6.25	18.75	0	0.0	57.14	1	3.23	32.26	8	12.70	66.67
14	0	0.0	18.75	0	0.0	57.14	0	0.0	32.26	2	3.17	69.84
16	0	0.0	18.75	0	0.0	57.14	0	0.0	32.26	3	4.76	74.60
18	0	0.0	18.75	0	0.0	57.14	0	0.0	32.26	2	3.17	77.78
20	0	0.0	18.75	0	0.0	57.14	1	3.23	35.48	2	3.17	80.95
22	1	6.25	25.00	2	28.57	85.71	1	3.23	38.71	0	0.0	80.95
24	1	6.25	31.25	0	0.0	85.71	0	0.0	38.71	1	1.59	82.54
26	0	0.0	31.25	0	0.0	85.71	0	0.0	38.71	1	1.59	84.13
28	0	0.0	31.25	0	0.0	85.71	1	3.23	41.94	1	1.59	85.71
30	0	0.0	31.25	0	0.0	85.71	0	0.0	41.94	0	0.0	85.71
32	0	0.0	31.25	0	0.0	85.71	0	0.0	41.94	0	0.0	85.71
34	0	0.0	31.25	0	0.0	85.71	1	3.23	45.16	0	0.0	85.71
36	0	0.0	31.25	0	0.0	85.71	0	0.0	45.16	0	0.0	85.71
38	0	0.0	31.25	0	0.0	85.71	0	0.0	45.16	2	3.17	88.89
40	1	6.25	37.50	0	0.0	85.71	0	0.0	45.16	1	1.59	90.48
42	0	0.0	37.50	0	0.0	85.71	0	0.0	45.16	0	0.0	90.48
44	1	6.25	43.75	0	0.0	85.71	0	0.0	45.16	2	3.17	93.65
46	0	0.0	43.75	0	0.0	85.71	0	0.0	45.16	0	0.0	93.65
48	0	0.0	43.75	1	14.29	100.00	1	3.23	48.39	0	0.0	93.65
50	0	0.0	43.75	0	0.0	100.00	0	0.0	48.39	1	1.59	95.24
52	0	0.0	43.75	0	0.0	100.00	0	0.0	48.39	0	0.0	95.24
54	1	6.25	50.00	0	0.0	100.00	0	0.0	48.39	1	1.59	96.83
56	0	0.0	50.00	0	0.0	100.00	0	0.0	48.39	1	1.59	98.41
58	1	6.25	56.25	0	0.0	100.00	0	0.0	48.39	0	0.0	98.41
60	1	6.25	62.50	0	0.0	100.00	2	6.45	54.84	0	0.0	98.41
90	1	6.25	68.75	0	0.0	100.00	4	12.90	67.74	1	1.59	100.00
120	0	0.0	68.75	0	0.0	100.00	5	16.13	83.87	0	0.0	100.00
150	3	18.75	87.50	0	0.0	100.00	2	6.45	90.32	0	0.0	100.00
180	0	0.0	87.50	0	0.0	100.00	0	0.0	90.32	0	0.0	100.00
210	0	0.0	87.50	0	0.0	100.00	2	6.45	96.77	0	0.0	100.00
240	2	12.50	100.00	0	0.0	100.00	0	0.0	96.77	0	0.0	100.00
270	0	0.0	100.00	0	0.0	100.00	0	0.0	96.77	0	0.0	100.00
300	0	0.0	100.00	0	0.0	100.00	0	0.0	96.77	0	0.0	100.00
330	0	0.0	100.00	0	0.0	100.00	0	0.0	96.77	0	0.0	100.00
360	0	0.0	100.00	0	0.0	100.00	0	0.0	96.77	0	0.0	100.00
390	0	0.0	100.00	0	0.0	100.00	1	3.23	100.00	0	0.0	100.00
420	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
	N = 16			N = 7			N = 31			N = 63		
	MEAN = 82.96			MEAN = 14.81			MEAN = 77.62			MEAN = 14.91		
	STD DEV = 77.54			STD DEV = 16.75			STD DEV = 85.33			STD DEV = 16.09		

DISTRIBUTION FUNCTIONS FOR ENGINE-OFF TIME
ALL NY TRUCKS:

MINUTES	COLD START FREQ.	COLD START DENS.	COLD START DIST.	WARM START FREQ.	WARM START DENS.	WARM START DIST.	NORMAL START FREQ.	NORMAL START DENS.	NORMAL START DIST.	HOT START FREQ.	HOT START DENS.	HOT START DIST.
1	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
2	0	0.0	0.0	1	14.29	14.29	2	6.67	6.67	4	6.35	6.35
3	0	0.0	0.0	0	0.0	14.29	2	6.67	13.33	4	6.35	12.70
4	0	0.0	0.0	1	14.29	28.57	0	0.0	13.33	4	6.35	19.05
5	1	100.00	100.00	0	0.0	28.57	2	6.67	20.00	7	11.11	30.16
6	0	0.0	100.00	0	0.0	28.57	0	0.0	20.00	7	11.11	41.27
7	0	0.0	100.00	0	0.0	28.57	0	0.0	20.00	7	11.11	52.38
8	0	0.0	100.00	0	0.0	28.57	0	0.0	20.00	2	3.17	55.56
9	0	0.0	100.00	0	0.0	28.57	1	3.33	23.33	1	1.59	57.14
10	0	0.0	100.00	0	0.0	28.57	0	0.0	23.33	3	4.76	61.90
11	0	0.0	100.00	0	0.0	28.57	2	6.67	30.00	2	3.17	65.08
12	0	0.0	100.00	0	0.0	28.57	0	0.0	30.00	4	6.35	71.43
13	0	0.0	100.00	0	0.0	28.57	1	3.33	33.33	6	9.52	80.95
14	0	0.0	100.00	0	0.0	28.57	1	3.33	36.67	0	0.0	80.95
15	0	0.0	100.00	0	0.0	28.57	1	3.33	40.00	4	6.35	87.30
20	0	0.0	100.00	0	0.0	28.57	4	13.33	53.33	5	7.94	95.24
25	0	0.0	100.00	0	0.0	28.57	2	6.67	60.00	2	3.17	98.41
30	0	0.0	100.00	0	0.0	28.57	0	0.0	60.00	1	1.59	100.00
35	0	0.0	100.00	0	0.0	28.57	6	20.00	80.00	0	0.0	100.00
40	0	0.0	100.00	1	14.29	42.86	0	0.0	80.00	0	0.0	100.00
45	0	0.0	100.00	0	0.0	42.86	0	0.0	80.00	0	0.0	100.00
50	0	0.0	100.00	0	0.0	42.86	1	3.33	83.33	0	0.0	100.00
55	0	0.0	100.00	0	0.0	42.86	2	6.67	90.00	0	0.0	100.00
60	0	0.0	100.00	0	0.0	42.86	1	3.33	93.33	0	0.0	100.00
65	0	0.0	100.00	1	14.29	57.14	0	0.0	93.33	0	0.0	100.00
70	0	0.0	100.00	0	0.0	57.14	1	3.33	96.67	0	0.0	100.00
75	0	0.0	100.00	0	0.0	57.14	1	3.33	100.00	0	0.0	100.00
80	0	0.0	100.00	0	0.0	57.14	0	0.0	100.00	0	0.0	100.00
85	0	0.0	100.00	0	0.0	57.14	0	0.0	100.00	0	0.0	100.00
90	0	0.0	100.00	1	14.29	71.43	0	0.0	100.00	0	0.0	100.00
95	0	0.0	100.00	0	0.0	71.43	0	0.0	100.00	0	0.0	100.00
100	0	0.0	100.00	0	0.0	71.43	0	0.0	100.00	0	0.0	100.00
105	0	0.0	100.00	0	0.0	71.43	0	0.0	100.00	0	0.0	100.00
110	0	0.0	100.00	1	14.29	85.71	0	0.0	100.00	0	0.0	100.00
115	0	0.0	100.00	0	0.0	85.71	0	0.0	100.00	0	0.0	100.00
120	0	0.0	100.00	0	0.0	85.71	0	0.0	100.00	0	0.0	100.00
135	0	0.0	100.00	0	0.0	85.71	0	0.0	100.00	0	0.0	100.00
150	0	0.0	100.00	0	0.0	85.71	0	0.0	100.00	0	0.0	100.00
165	0	0.0	100.00	0	0.0	85.71	0	0.0	100.00	0	0.0	100.00
180	0	0.0	100.00	0	0.0	85.71	0	0.0	100.00	0	0.0	100.00
195	0	0.0	100.00	0	0.0	85.71	0	0.0	100.00	0	0.0	100.00
210	0	0.0	100.00	0	0.0	85.71	0	0.0	100.00	0	0.0	100.00
225	0	0.0	100.00	0	0.0	85.71	0	0.0	100.00	0	0.0	100.00
240	0	0.0	100.00	0	0.0	85.71	0	0.0	100.00	0	0.0	100.00
270	0	0.0	100.00	0	0.0	85.71	0	0.0	100.00	0	0.0	100.00
300	0	0.0	100.00	0	0.0	85.71	0	0.0	100.00	0	0.0	100.00
330	0	0.0	100.00	0	0.0	85.71	0	0.0	100.00	0	0.0	100.00
360	0	0.0	100.00	0	0.0	85.71	0	0.0	100.00	0	0.0	100.00
ABOVE 360	0	0.0	100.00	1	14.29	100.00	0	0.0	100.00	0	0.0	100.00
	N = 1			N = 7			N = 30			N = 63		
	MEAN = 0.0			MEAN = 741.14			MEAN = 26.70			MEAN = 9.51		
	STD DEV = 0.0			STD DEV = 1825.52			STD DEV = 20.84			STD DEV = 6.14		

DISTRIBUTION FUNCTIONS FOR INITIAL IDLE TIME
ALL GAS:

SECONDS	COLD START FREQ.	COLD START DENS.	COLD START DIST.	WARM START FREQ.	WARM START DENS.	WARM START DIST.	NORMAL START FREQ.	NORMAL START DENS.	NORMAL START DIST.	HOT START FREQ.	HOT START DENS.	HOT START DIST.
0	7	25.93	25.93	0	0.0	0.0	3	4.92	4.92	3	2.00	2.00
2	1	3.70	29.63	1	6.67	6.67	5	8.20	13.11	34	22.67	24.67
4	1	3.70	33.33	1	6.67	13.33	11	18.03	31.15	35	23.33	48.00
6	1	3.70	37.04	1	6.67	20.00	10	16.39	47.54	25	16.67	64.67
8	0	0.0	37.04	1	6.67	26.67	1	1.64	49.18	8	5.33	70.00
10	0	0.0	37.04	0	0.0	26.67	6	9.84	59.02	10	6.67	76.67
12	1	3.70	40.74	0	0.0	26.67	4	6.56	65.57	2	1.33	78.00
14	1	3.70	44.44	0	0.0	26.67	1	1.64	67.21	4	2.67	80.67
16	1	3.70	48.15	2	13.33	40.00	4	6.56	73.77	5	3.33	84.00
18	0	0.0	48.15	0	0.0	40.00	0	0.0	73.77	0	0.0	84.00
20	0	0.0	48.15	1	6.67	46.67	1	1.64	75.41	2	1.33	85.33
22	0	0.0	48.15	1	6.67	53.33	1	1.64	77.05	1	0.67	86.00
24	1	3.70	51.85	0	0.0	53.33	1	1.64	78.69	1	0.67	86.67
26	1	3.70	55.56	2	13.33	66.67	0	0.0	78.69	2	1.33	88.00
28	0	0.0	55.56	0	0.0	66.67	0	0.0	78.69	0	0.0	88.00
30	1	3.70	59.26	1	6.67	73.33	0	0.0	78.69	0	0.0	88.00
32	1	3.70	62.96	0	0.0	73.33	0	0.0	78.69	0	0.0	88.00
34	0	0.0	62.96	0	0.0	73.33	0	0.0	78.69	0	0.0	88.00
36	0	0.0	62.96	1	6.67	80.00	2	3.28	81.97	3	2.00	90.00
38	0	0.0	62.96	0	0.0	80.00	1	1.64	83.61	1	0.67	90.67
40	0	0.0	62.96	0	0.0	80.00	0	0.0	83.61	1	0.67	91.33
42	1	3.70	66.67	0	0.0	80.00	0	0.0	83.61	0	0.0	91.33
44	0	0.0	66.67	0	0.0	80.00	0	0.0	83.61	1	0.67	92.00
46	0	0.0	66.67	1	6.67	86.67	0	0.0	83.61	2	1.33	93.33
48	1	3.70	70.37	0	0.0	86.67	0	0.0	83.61	0	0.0	93.33
50	0	0.0	70.37	0	0.0	86.67	1	1.64	85.25	1	0.67	94.00
52	0	0.0	70.37	0	0.0	86.67	2	3.28	88.52	0	0.0	94.00
54	0	0.0	70.37	0	0.0	86.67	0	0.0	88.52	0	0.0	94.00
56	0	0.0	70.37	0	0.0	86.67	0	0.0	88.52	0	0.0	94.00
58	0	0.0	70.37	0	0.0	86.67	0	0.0	88.52	0	0.0	94.00
1	0	0.0	70.37	0	0.0	86.67	3	4.92	93.44	6	4.00	98.00
2	1	3.70	74.07	2	13.33	100.00	1	1.64	95.08	0	0.0	98.00
3	2	7.41	81.48	0	0.0	100.00	1	1.64	96.72	2	1.33	99.33
4	1	3.70	85.18	0	0.0	100.00	1	1.64	98.36	0	0.0	99.33
5	1	3.70	88.89	0	0.0	100.00	0	0.0	98.36	0	0.0	99.33
6	1	3.70	92.59	0	0.0	100.00	0	0.0	98.36	0	0.0	99.33
7	1	3.70	96.30	0	0.0	100.00	0	0.0	98.36	0	0.0	99.33
8	1	3.70	100.00	0	0.0	100.00	0	0.0	98.36	1	0.67	100.00
9	0	0.0	100.00	0	0.0	100.00	0	0.0	98.36	0	0.0	100.00
10	0	0.0	100.00	0	0.0	100.00	0	0.0	98.36	0	0.0	100.00
11	0	0.0	100.00	0	0.0	100.00	0	0.0	98.36	0	0.0	100.00
12	0	0.0	100.00	0	0.0	100.00	0	0.0	98.36	0	0.0	100.00
13	0	0.0	100.00	0	0.0	100.00	1	1.64	100.00	0	0.0	100.00
14	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
15	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
16	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
17	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
18	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
	N = 27			N = 15			N = 61			N = 150		
	MEAN = 1.64			MEAN = 0.64			MEAN = 0.67			MEAN = 0.28		
	STD DEV = 2.48			STD DEV = 0.84			STD DEV = 1.90			STD DEV = 0.80		

DISTRIBUTION FUNCTIONS FOR TOTAL TRIP TIME
ALL GAS:

MINUTES	COLD START FREQ.	COLD START DENS.	COLD START DIST.	WARM START FREQ.	WARM START DENS.	WARM START DIST.	NORMAL START FREQ.	NORMAL START DENS.	NORMAL START DIST.	HOT START FREQ.	HOT START DENS.	HOT START DIST.
0	0	0.0	0.0	0	0.0	0.0	2	3.28	3.28	5	3.33	3.33
1	3	11.11	11.11	0	0.0	0.0	2	3.28	6.56	15	10.00	13.33
2	0	0.0	11.11	0	0.0	0.0	6	9.84	16.39	7	4.67	18.00
3	1	3.70	14.81	2	13.33	13.33	2	3.28	19.67	8	5.33	23.33
4	0	0.0	14.81	0	0.0	13.33	2	3.28	22.95	11	7.33	30.67
5	0	0.0	14.81	1	6.67	20.00	2	3.28	26.23	7	4.67	35.33
6	1	3.70	18.52	0	0.0	20.00	4	6.56	32.79	9	6.00	41.33
7	1	3.70	22.22	2	13.33	33.33	3	4.92	37.70	3	2.00	43.33
8	0	0.0	22.22	0	0.0	33.33	3	4.92	42.62	4	2.67	46.00
9	0	0.0	22.22	2	13.33	46.67	4	6.56	49.18	4	2.67	48.67
10	1	3.70	25.93	1	6.67	53.33	3	4.92	54.10	6	4.00	52.67
12	3	11.11	37.04	1	6.67	60.00	2	3.28	57.38	12	8.00	60.67
14	0	0.0	37.04	1	6.67	66.67	2	3.28	60.66	6	4.00	64.67
16	0	0.0	37.04	0	0.0	66.67	2	3.28	63.93	6	4.00	68.67
18	0	0.0	37.04	0	0.0	66.67	0	0.0	63.93	7	4.67	73.33
20	1	3.70	40.74	0	0.0	66.67	0	0.0	63.93	4	2.67	76.00
22	0	0.0	40.74	1	6.67	73.33	1	1.64	65.57	1	0.67	76.67
24	1	3.70	44.44	0	0.0	73.33	1	1.64	67.21	4	2.67	79.33
26	1	3.70	48.15	0	0.0	73.33	0	0.0	67.21	1	0.67	80.00
28	0	0.0	48.15	0	0.0	73.33	2	3.28	70.49	2	1.33	81.33
30	0	0.0	48.15	0	0.0	73.33	0	0.0	70.49	2	1.33	82.67
32	0	0.0	48.15	1	6.67	80.00	1	1.64	72.13	1	0.67	83.33
34	0	0.0	48.15	1	6.67	86.67	3	4.92	77.05	1	0.67	84.00
36	1	3.70	51.85	0	0.0	86.67	0	0.0	77.05	1	0.67	84.67
38	0	0.0	51.85	0	0.0	86.67	1	1.64	78.69	3	2.00	86.67
40	1	3.70	55.56	0	0.0	86.67	0	0.0	78.69	2	1.33	88.00
42	1	3.70	59.25	0	0.0	86.67	0	0.0	78.69	1	0.67	88.67
44	1	3.70	62.96	0	0.0	86.67	1	1.64	80.33	2	1.33	90.00
46	2	7.41	70.37	0	0.0	86.67	0	0.0	80.33	1	0.67	90.67
48	0	0.0	70.37	0	0.0	86.67	1	1.64	81.97	1	0.67	91.33
50	0	0.0	70.37	0	0.0	86.67	0	0.0	81.97	2	1.33	92.67
52	0	0.0	70.37	0	0.0	86.67	0	0.0	81.97	0	0.0	92.67
54	0	0.0	70.37	0	0.0	86.67	0	0.0	81.97	2	1.33	94.00
56	0	0.0	70.37	0	0.0	86.67	1	1.64	83.61	1	0.67	94.67
58	0	0.0	70.37	0	0.0	86.67	0	0.0	83.61	1	0.67	95.33
60	2	7.41	77.78	1	6.67	93.33	3	4.92	88.52	4	2.67	98.00
90	2	7.41	85.18	0	0.0	93.33	4	6.56	95.08	0	0.0	98.00
120	0	0.0	85.18	0	0.0	93.33	1	1.64	96.72	2	1.33	99.33
150	3	11.11	96.30	1	6.67	100.00	1	1.64	98.36	0	0.0	99.33
180	0	0.0	96.30	0	0.0	100.00	0	0.0	98.36	1	0.67	100.00
210	0	0.0	96.30	0	0.0	100.00	1	1.64	100.00	0	0.0	100.00
240	1	3.70	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
270	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
300	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
330	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
360	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
390	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
420	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
	N = 27			N = 15			N = 61			N = 150		
	MEAN = 51.80			MEAN = 25.45			MEAN = 28.30			MEAN = 17.92		
	STD DEV = 60.05			STD DEV = 36.94			STD DEV = 40.80			STD DEV = 24.78		

DISTRIBUTION FUNCTIONS FOR ENGINE-OFF TIME
ALL GAS:

MINUTES	COLD START FREQ.	COLD START DENS.	COLD START DIST.	WARM START FREQ.	WARM START DENS.	WARM START DIST.	NORMAL START FREQ.	NORMAL START DENS.	NORMAL START DIST.	HOT START FREQ.	HOT START DENS.	HOT START DIST.
1	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
2	1	50.00	50.00	0	0.0	0.0	8	13.33	13.33	9	6.00	6.00
3	0	0.0	50.00	0	0.0	0.0	3	5.00	18.33	10	6.67	12.67
4	0	0.0	50.00	1	6.67	6.67	2	3.33	21.67	12	8.00	20.67
5	0	0.0	50.00	0	0.0	6.67	1	1.67	23.33	14	9.33	30.00
6	0	0.0	50.00	0	0.0	6.67	1	1.67	25.00	11	7.33	37.33
7	0	0.0	50.00	0	0.0	6.67	0	0.0	25.00	11	7.33	44.67
8	0	0.0	50.00	0	0.0	6.67	0	0.0	25.00	8	5.33	50.00
9	0	0.0	50.00	0	0.0	6.67	0	0.0	25.00	5	3.33	53.33
10	0	0.0	50.00	0	0.0	6.67	0	0.0	25.00	4	2.67	56.00
11	0	0.0	50.00	0	0.0	6.67	2	3.33	28.33	6	4.00	60.00
12	0	0.0	50.00	0	0.0	6.67	0	0.0	28.33	7	4.67	64.67
13	0	0.0	50.00	0	0.0	6.67	1	1.67	30.00	10	6.67	71.33
14	0	0.0	50.00	0	0.0	6.67	1	1.67	31.67	6	4.00	75.33
15	0	0.0	50.00	0	0.0	6.67	1	1.67	33.33	6	4.00	79.33
20	0	0.0	50.00	1	6.67	13.33	6	10.00	43.33	12	8.00	87.33
25	0	0.0	50.00	1	6.67	20.00	5	8.33	51.67	8	5.33	92.67
30	0	0.0	50.00	1	6.67	26.67	6	10.00	61.67	5	3.33	96.00
35	0	0.0	50.00	0	0.0	26.67	8	13.33	75.00	2	1.33	97.33
40	0	0.0	50.00	2	13.33	40.00	1	1.67	76.67	0	0.0	97.33
45	0	0.0	50.00	2	13.33	53.33	2	3.33	80.00	1	0.67	98.00
50	0	0.0	50.00	0	0.0	53.33	1	1.67	81.67	2	1.33	99.33
55	0	0.0	50.00	0	0.0	53.33	5	8.33	90.00	0	0.0	99.33
60	0	0.0	50.00	0	0.0	53.33	1	1.67	91.67	0	0.0	99.33
65	1	50.00	100.00	1	6.67	60.00	0	0.0	91.67	0	0.0	99.33
70	0	0.0	100.00	0	0.0	60.00	2	3.33	95.00	1	0.67	100.00
75	0	0.0	100.00	0	0.0	60.00	2	3.33	98.33	0	0.0	100.00
80	0	0.0	100.00	0	0.0	60.00	0	0.0	98.33	0	0.0	100.00
85	0	0.0	100.00	0	0.0	60.00	0	0.0	98.33	0	0.0	100.00
90	0	0.0	100.00	0	0.0	60.00	0	0.0	98.33	0	0.0	100.00
95	0	0.0	100.00	1	6.67	66.67	0	0.0	98.33	0	0.0	100.00
100	0	0.0	100.00	1	6.67	73.33	0	0.0	98.33	0	0.0	100.00
105	0	0.0	100.00	0	0.0	73.33	1	1.67	100.00	0	0.0	100.00
110	0	0.0	100.00	2	13.33	86.67	0	0.0	100.00	0	0.0	100.00
115	0	0.0	100.00	0	0.0	86.67	0	0.0	100.00	0	0.0	100.00
120	0	0.0	100.00	0	0.0	86.67	0	0.0	100.00	0	0.0	100.00
150	0	0.0	100.00	0	0.0	86.67	0	0.0	100.00	0	0.0	100.00
152	0	0.0	100.00	2	13.33	100.00	0	0.0	100.00	0	0.0	100.00
155	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
180	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
195	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
210	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
225	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
240	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
270	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
300	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
330	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
360	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
ABOVE 360	0	0.0	100.00									
	N = 2			N = 15			N = 60			N = 150		
	MEAN = 32.50			MEAN = 70.87			MEAN = 28.67			MEAN = 11.87		
	STD DEV = 43.13			STD DEV = 52.84			STD DEV = 23.28			STD DEV = 10.42		

DISTRIBUTION FUNCTIONS FOR INITIAL IDLE TIME
ALL DIESEL:

SECONDS	COLD START FREQ.	COLD START DENS.	COLD START DIST.	WARM START FREQ.	WARM START DENS.	WARM START DIST.	NORMAL START FREQ.	NORMAL START DENS.	NORMAL START DIST.	HOT START FREQ.	HOT START DENS.	HOT START DIST.
0	6	28.57	28.57	3	13.64	13.64	0	0.0	0.0	1	100.00	100.00
2	2	9.52	38.10	1	4.55	18.18	1	2.86	2.86	0	0.0	100.00
4	0	0.0	38.10	2	9.09	27.27	5	14.29	17.14	0	0.0	100.00
6	1	4.76	42.86	6	27.27	54.55	10	28.57	45.71	0	0.0	100.00
8	0	0.0	42.86	0	0.0	54.55	2	5.71	51.43	0	0.0	100.00
10	0	0.0	42.86	1	4.55	59.09	3	8.57	60.00	0	0.0	100.00
12	2	9.52	52.38	1	4.55	63.64	0	0.0	60.00	0	0.0	100.00
14	0	0.0	52.38	0	0.0	63.64	2	5.71	65.71	0	0.0	100.00
16	0	0.0	52.38	0	0.0	63.64	3	8.57	74.29	0	0.0	100.00
18	0	0.0	52.38	1	4.55	68.18	1	2.86	77.14	0	0.0	100.00
20	1	4.76	57.14	1	4.55	72.73	0	0.0	77.14	0	0.0	100.00
22	0	0.0	57.14	0	0.0	72.73	1	2.86	80.00	0	0.0	100.00
24	0	0.0	57.14	0	0.0	72.73	1	2.86	82.86	0	0.0	100.00
26	1	4.76	61.90	0	0.0	72.73	1	2.86	85.71	0	0.0	100.00
28	0	0.0	61.90	1	4.55	77.27	0	0.0	85.71	0	0.0	100.00
30	0	0.0	61.90	0	0.0	77.27	0	0.0	85.71	0	0.0	100.00
32	0	0.0	61.90	1	4.55	81.82	0	0.0	85.71	0	0.0	100.00
34	0	0.0	61.90	0	0.0	81.82	0	0.0	85.71	0	0.0	100.00
36	0	0.0	61.90	0	0.0	81.82	0	0.0	85.71	0	0.0	100.00
38	0	0.0	61.90	1	4.55	86.36	0	0.0	85.71	0	0.0	100.00
40	1	4.76	66.67	0	0.0	86.36	1	2.86	88.57	0	0.0	100.00
42	0	0.0	66.67	0	0.0	86.36	0	0.0	88.57	0	0.0	100.00
44	0	0.0	66.67	0	0.0	86.36	0	0.0	88.57	0	0.0	100.00
46	0	0.0	66.67	0	0.0	86.36	0	0.0	88.57	0	0.0	100.00
48	0	0.0	66.67	0	0.0	86.36	0	0.0	88.57	0	0.0	100.00
50	0	0.0	66.67	0	0.0	86.36	1	2.86	91.43	0	0.0	100.00
52	0	0.0	66.67	0	0.0	86.36	0	0.0	91.43	0	0.0	100.00
54	0	0.0	66.67	0	0.0	86.36	1	2.86	94.29	0	0.0	100.00
56	0	0.0	66.67	0	0.0	86.36	0	0.0	94.29	0	0.0	100.00
58	0	0.0	66.67	0	0.0	86.36	0	0.0	94.29	0	0.0	100.00
1	1	4.76	71.43	3	13.64	100.00	2	5.71	100.00	0	0.0	100.00
2	1	4.76	76.19	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
3	1	4.76	80.95	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
4	1	4.76	85.71	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
5	0	0.0	85.71	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
6	1	4.76	90.48	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
7	1	4.76	95.24	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
8	0	0.0	95.24	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
9	0	0.0	95.24	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
10	0	0.0	95.24	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
11	0	0.0	95.24	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
12	0	0.0	95.24	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
13	0	0.0	95.24	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
14	0	0.0	95.24	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
15	1	4.76	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
16	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
17	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
18	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
	N = 21			N = 22			N = 35			N = 1		
	MEAN = 2.05			MEAN = 0.37			MEAN = 0.28			MEAN = 0.0		
	STD DEV = 3.74			STD DEV = 0.53			STD DEV = 0.32			STD DEV = 0.0		

DISTRIBUTION FUNCTIONS FOR TOTAL TRIP TIME
ALL DIESEL:

MINUTES	COLD START FREQ.	COLD START DENS.	COLD START DIST.	WARM START FREQ.	WARM START DENS.	WARM START DIST.	NORMAL START FREQ.	NORMAL START DENS.	NORMAL START DIST.	HOT START FREQ.	HOT START DENS.	HOT START DIST.
0	1	4.76	4.76	0	0.0	0.0	3	8.57	8.57	0	0.0	0.0
1	0	0.0	4.76	0	0.0	0.0	2	5.71	14.29	0	0.0	0.0
2	1	4.76	9.52	1	4.55	4.55	0	0.0	14.29	0	0.0	0.0
3	0	0.0	9.52	0	0.0	4.55	1	2.86	17.14	0	0.0	0.0
4	0	0.0	9.52	0	0.0	4.55	2	5.71	22.86	0	0.0	0.0
5	0	0.0	9.52	0	0.0	4.55	0	0.0	22.86	0	0.0	0.0
6	0	0.0	9.52	2	9.09	13.64	0	0.0	22.86	0	0.0	0.0
7	1	4.76	14.29	0	0.0	13.64	0	0.0	22.86	0	0.0	0.0
8	0	0.0	14.29	0	0.0	13.64	2	5.71	28.57	0	0.0	0.0
9	0	0.0	14.29	0	0.0	13.64	0	0.0	28.57	0	0.0	0.0
10	0	0.0	14.29	0	0.0	13.64	0	0.0	28.57	0	0.0	0.0
12	0	0.0	14.29	0	0.0	13.64	1	2.86	31.43	0	0.0	0.0
14	0	0.0	14.29	0	0.0	13.64	0	0.0	31.43	0	0.0	0.0
16	0	0.0	14.29	0	0.0	13.64	0	0.0	31.43	0	0.0	0.0
18	0	0.0	14.29	1	4.55	18.18	1	2.86	34.29	0	0.0	0.0
20	0	0.0	14.29	0	0.0	18.18	1	2.86	37.14	0	0.0	0.0
22	1	4.76	19.05	1	4.55	22.73	0	0.0	37.14	0	0.0	0.0
24	0	0.0	19.05	1	4.55	27.27	1	2.86	40.00	0	0.0	0.0
26	0	0.0	19.05	0	0.0	27.27	0	0.0	40.00	0	0.0	0.0
28	0	0.0	19.05	0	0.0	27.27	0	0.0	40.00	0	0.0	0.0
30	0	0.0	19.05	2	9.09	36.36	0	0.0	40.00	0	0.0	0.0
32	1	4.76	23.81	1	4.55	40.91	1	2.86	42.86	0	0.0	0.0
34	0	0.0	23.81	1	4.55	45.45	0	0.0	42.86	0	0.0	0.0
36	0	0.0	23.81	0	0.0	45.45	0	0.0	42.86	0	0.0	0.0
38	1	4.76	28.57	0	0.0	45.45	0	0.0	42.86	0	0.0	0.0
40	0	0.0	28.57	1	4.55	50.00	1	2.86	45.71	0	0.0	0.0
42	0	0.0	28.57	0	0.0	50.00	0	0.0	45.71	0	0.0	0.0
44	1	4.76	33.33	0	0.0	50.00	0	0.0	45.71	0	0.0	0.0
46	1	4.76	38.10	0	0.0	50.00	0	0.0	45.71	0	0.0	0.0
48	0	0.0	38.10	2	9.09	59.09	1	2.86	48.57	0	0.0	0.0
50	3	14.28	52.38	0	0.0	59.09	1	2.86	51.43	0	0.0	0.0
52	0	0.0	52.38	2	9.09	68.18	1	2.86	54.29	0	0.0	0.0
54	1	4.76	57.14	0	0.0	68.18	0	0.0	54.29	0	0.0	0.0
56	1	4.76	61.90	1	4.55	72.73	0	0.0	54.29	0	0.0	0.0
58	1	4.76	66.67	0	0.0	72.73	0	0.0	54.29	0	0.0	0.0
60	0	0.0	66.67	3	13.64	86.36	3	8.57	62.86	0	0.0	0.0
90	1	4.76	71.43	1	4.55	90.91	2	5.71	68.57	1	100.00	100.00
120	0	0.0	71.43	0	0.0	90.91	4	11.43	80.00	0	0.0	100.00
150	2	9.52	80.95	2	9.09	100.00	3	8.57	88.57	0	0.0	100.00
180	1	4.76	85.71	0	0.0	100.00	0	0.0	88.57	0	0.0	100.00
210	1	4.76	90.48	0	0.0	100.00	2	5.71	94.29	0	0.0	100.00
240	1	4.76	95.24	0	0.0	100.00	1	2.86	97.14	0	0.0	100.00
270	0	0.0	95.24	0	0.0	100.00	0	0.0	97.14	0	0.0	100.00
300	0	0.0	95.24	0	0.0	100.00	0	0.0	97.14	0	0.0	100.00
330	1	4.76	100.00	0	0.0	100.00	0	0.0	97.14	0	0.0	100.00
360	0	0.0	100.00	0	0.0	100.00	1	2.86	100.00	0	0.0	100.00
390	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
420	0	0.0	100.00									
	N = 21			N = 22			N = 35			N = 1		
	MEAN = 89.48			MEAN = 48.82			MEAN = 76.12			MEAN = 0.0		
	STD DEV = 88.05			STD DEV = 39.13			STD DEV = 87.22			STD DEV = 0.0		

DISTRIBUTION FUNCTIONS FOR ENGINE-OFF TIME
ALL DIESEL:

MINUTES	COLD START FREQ.	COLD START DENS.	COLD START DIST.	WARM START FREQ.	WARM START DENS.	WARM START DIST.	NORMAL START FREQ.	NORMAL START DENS.	NORMAL START DIST.	HOT START FREQ.	HOT START DENS.	HOT START DIST.
1	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
2	0	0.0	0.0	1	4.55	4.55	3	8.57	8.57	0	0.0	0.0
3	0	0.0	0.0	0	0.0	4.55	0	0.0	8.57	0	0.0	0.0
4	0	0.0	0.0	0	0.0	4.55	1	2.86	11.43	0	0.0	0.0
5	1	25.00	25.00	1	4.55	9.09	3	8.57	20.00	0	0.0	0.0
6	0	0.0	25.00	2	9.09	18.18	2	5.71	25.71	0	0.0	0.0
7	0	0.0	25.00	0	0.0	18.18	1	2.86	28.57	0	0.0	0.0
8	0	0.0	25.00	0	0.0	18.18	0	0.0	28.57	0	0.0	0.0
9	0	0.0	25.00	0	0.0	18.18	3	8.57	37.14	0	0.0	0.0
10	0	0.0	25.00	0	0.0	18.18	3	8.57	45.71	0	0.0	0.0
11	0	0.0	25.00	0	0.0	18.18	3	8.57	54.29	0	0.0	0.0
12	0	0.0	25.00	0	0.0	18.18	1	2.86	57.14	0	0.0	0.0
13	0	0.0	25.00	1	4.55	22.73	0	0.0	57.14	0	0.0	0.0
14	0	0.0	25.00	1	4.55	27.27	3	8.57	65.71	0	0.0	0.0
15	0	0.0	25.00	0	0.0	27.27	0	0.0	65.71	0	0.0	0.0
20	1	25.00	50.00	0	0.0	27.27	1	2.86	68.57	1	100.00	100.00
25	0	0.0	50.00	1	4.55	31.82	2	5.71	74.29	0	0.0	100.00
30	0	0.0	50.00	1	4.55	36.36	2	5.71	80.00	0	0.0	100.00
35	0	0.0	50.00	0	0.0	36.36	2	5.71	85.71	0	0.0	100.00
40	1	25.00	75.00	3	13.64	50.00	1	2.86	88.57	0	0.0	100.00
45	0	0.0	75.00	1	4.55	54.55	1	2.86	91.43	0	0.0	100.00
50	0	0.0	75.00	0	0.0	54.55	1	2.86	94.29	0	0.0	100.00
55	0	0.0	75.00	0	0.0	54.55	1	2.86	97.14	0	0.0	100.00
60	0	0.0	75.00	0	0.0	54.55	0	0.0	97.14	0	0.0	100.00
65	0	0.0	75.00	1	4.55	59.09	1	2.86	100.00	0	0.0	100.00
70	0	0.0	75.00	0	0.0	59.09	0	0.0	100.00	0	0.0	100.00
75	0	0.0	75.00	0	0.0	59.09	0	0.0	100.00	0	0.0	100.00
80	0	0.0	75.00	2	9.09	68.18	0	0.0	100.00	0	0.0	100.00
85	0	0.0	75.00	0	0.0	68.18	0	0.0	100.00	0	0.0	100.00
90	0	0.0	75.00	1	4.55	72.73	0	0.0	100.00	0	0.0	100.00
95	0	0.0	75.00	1	4.55	77.27	0	0.0	100.00	0	0.0	100.00
100	0	0.0	75.00	0	0.0	77.27	0	0.0	100.00	0	0.0	100.00
105	0	0.0	75.00	0	0.0	77.27	0	0.0	100.00	0	0.0	100.00
110	0	0.0	75.00	0	0.0	77.27	0	0.0	100.00	0	0.0	100.00
115	0	0.0	75.00	0	0.0	77.27	0	0.0	100.00	0	0.0	100.00
120	0	0.0	75.00	1	4.55	81.82	0	0.0	100.00	0	0.0	100.00
135	0	0.0	75.00	1	4.55	86.36	0	0.0	100.00	0	0.0	100.00
150	0	0.0	75.00	1	4.55	90.91	0	0.0	100.00	0	0.0	100.00
165	0	0.0	75.00	0	0.0	90.91	0	0.0	100.00	0	0.0	100.00
180	0	0.0	75.00	0	0.0	90.91	0	0.0	100.00	0	0.0	100.00
195	0	0.0	75.00	1	4.55	95.45	0	0.0	100.00	0	0.0	100.00
210	0	0.0	75.00	0	0.0	95.45	0	0.0	100.00	0	0.0	100.00
225	0	0.0	75.00	0	0.0	95.45	0	0.0	100.00	0	0.0	100.00
240	0	0.0	75.00	0	0.0	95.45	0	0.0	100.00	0	0.0	100.00
270	0	0.0	75.00	0	0.0	95.45	0	0.0	100.00	0	0.0	100.00
300	0	0.0	75.00	0	0.0	95.45	0	0.0	100.00	0	0.0	100.00
330	0	0.0	75.00	0	0.0	95.45	0	0.0	100.00	0	0.0	100.00
360	0	0.0	75.00	0	0.0	95.45	0	0.0	100.00	0	0.0	100.00
ABOVE 360	1	25.00	100.00	1	4.55	100.00	0	0.0	100.00	0	0.0	100.00
	N = 4			N = 22			N = 35			N = 1		
	MEAN = 126.75			MEAN = 280.05			MEAN = 18.43			MEAN = 0.0		
	STD DEV = 213.27			STD DEV = 1028.82			STD DEV = 16.49			STD DEV = 0.0		

DISTRIBUTION FUNCTIONS FOR INITIAL IDLE TIME
ALL TRUCKS:

SECONDS	COLD START FREQ.	COLD START DENS.	COLD START DIST.	WARM START FREQ.	WARM START DENS.	WARM START DIST.	NORMAL START FREQ.	NORMAL START DENS.	NORMAL START DIST.	HOT START FREQ.	HOT START DENS.	HOT START DIST.
0	13	27.08	27.08	3	8.11	8.11	3	3.13	3.13	4	2.65	2.65
2	3	6.25	33.33	2	5.41	13.51	6	6.25	9.38	34	22.52	25.17
4	1	2.08	35.42	3	8.11	21.62	16	16.67	26.04	35	23.18	48.34
6	2	4.17	39.58	7	18.92	40.54	20	20.83	46.87	25	16.56	64.90
8	0	0.0	39.58	1	2.70	43.24	3	3.13	50.00	8	5.30	70.20
10	0	0.0	39.58	1	2.70	45.95	9	9.38	59.37	10	6.62	76.82
12	3	6.25	45.83	1	2.70	48.65	4	4.17	63.54	2	1.32	78.15
14	1	2.08	47.92	0	0.0	48.65	3	3.13	66.67	4	2.65	80.79
16	1	2.08	50.00	2	5.41	54.05	7	7.29	73.96	5	3.31	84.11
18	0	0.0	50.00	1	2.70	56.76	1	1.04	75.00	0	0.0	84.11
20	1	2.08	52.08	2	5.41	62.16	1	1.04	76.04	2	1.32	85.43
22	0	0.0	52.08	1	2.70	64.86	2	2.08	78.12	1	0.66	86.09
24	1	2.08	54.17	0	0.0	64.86	2	2.08	80.21	1	0.66	86.75
26	2	4.17	58.33	2	5.41	70.27	1	1.04	81.25	2	1.32	88.08
28	0	0.0	58.33	1	2.70	72.97	0	0.0	81.25	0	0.0	88.08
30	1	2.08	60.42	1	2.70	75.68	0	0.0	81.25	0	0.0	88.08
32	1	2.08	62.50	1	2.70	78.38	0	0.0	81.25	0	0.0	88.08
34	0	0.0	62.50	0	0.0	78.38	0	0.0	81.25	0	0.0	88.08
36	0	0.0	62.50	1	2.70	81.08	2	2.08	83.33	3	1.99	90.07
38	0	0.0	62.50	1	2.70	81.78	1	1.04	84.37	1	0.66	90.73
40	1	2.08	64.58	0	0.0	83.78	1	1.04	85.42	1	0.66	91.39
42	1	2.08	66.67	0	0.0	83.78	0	0.0	85.42	0	0.0	91.39
44	0	0.0	66.67	0	0.0	83.78	0	0.0	85.42	1	0.66	92.05
46	0	0.0	66.67	1	2.70	86.49	0	0.0	85.42	2	1.32	93.38
48	1	2.08	68.75	0	0.0	86.49	0	0.0	85.42	0	0.0	93.38
50	0	0.0	68.75	0	0.0	86.49	2	2.08	87.50	1	0.66	94.04
52	0	0.0	68.75	0	0.0	86.49	2	2.08	89.58	0	0.0	94.04
54	0	0.0	68.75	0	0.0	86.49	1	1.04	90.62	0	0.0	94.04
56	0	0.0	68.75	0	0.0	86.49	0	0.0	90.62	0	0.0	94.04
58	0	0.0	68.75	0	0.0	86.49	0	0.0	90.62	0	0.0	94.04
1	1	2.08	70.83	3	8.11	94.59	5	5.21	95.83	6	3.97	98.01
2	2	4.17	75.00	2	5.41	100.00	1	1.04	96.87	0	0.0	98.01
3	3	6.25	81.25	0	0.0	100.00	1	1.04	97.92	2	1.32	99.34
4	2	4.17	85.42	0	0.0	100.00	1	1.04	98.96	0	0.0	99.34
5	1	2.08	87.50	0	0.0	100.00	0	0.0	98.96	0	0.0	99.34
6	2	4.17	91.67	0	0.0	100.00	0	0.0	98.96	0	0.0	99.34
7	2	4.17	95.83	0	0.0	100.00	0	0.0	98.96	0	0.0	99.34
8	1	2.08	97.92	0	0.0	100.00	0	0.0	98.96	1	0.66	100.00
9	0	0.0	97.92	0	0.0	100.00	0	0.0	98.96	0	0.0	100.00
10	0	0.0	97.92	0	0.0	100.00	0	0.0	98.96	0	0.0	100.00
11	0	0.0	97.92	0	0.0	100.00	0	0.0	98.96	0	0.0	100.00
12	0	0.0	97.92	0	0.0	100.00	0	0.0	98.96	0	0.0	100.00
13	0	0.0	97.92	0	0.0	100.00	1	1.04	100.00	0	0.0	100.00
14	0	0.0	97.92	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
15	1	2.08	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
16	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
17	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
18	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
	N = 48			N = 37			N = 96			N = 151		
	MEAN = 1.82			MEAN = 0.48			MEAN = 0.53			MEAN = 0.28		
	STD DEV = 3.07			STD DEV = 0.68			STD DEV = 1.53			STD DEV = 0.30		

DISTRIBUTION FUNCTIONS FOR TOTAL TRIP TIME
ALL TRUCKS

MINUTES	COLD START FREQ.	COLD START DENS.	COLD START DIST.	WARM START FREQ.	WARM START DENS.	WARM START DIST.	NORMAL START FREQ.	NORMAL START DENS.	NORMAL START DIST.	HOT START FREQ.	HOT START DENS.	HOT START DIST.
0	1	2.08	2.08	0	0.0	0.0	5	5.21	5.21	5	3.31	3.31
1	3	6.25	8.33	0	0.0	0.0	4	4.17	9.37	15	9.93	13.25
2	1	2.08	10.42	1	2.70	2.70	6	6.25	15.62	7	4.64	17.88
3	1	2.08	12.50	2	5.41	8.11	3	3.13	18.75	8	5.30	23.18
4	0	0.0	12.50	0	0.0	8.11	4	4.17	22.92	11	7.28	30.46
5	0	0.0	12.50	1	2.70	10.81	2	2.08	25.00	7	4.64	35.10
6	1	2.08	14.58	2	5.41	16.22	4	4.17	29.17	9	5.96	41.06
7	2	4.17	18.75	2	5.41	21.62	3	3.13	32.29	3	1.99	43.05
8	0	0.0	18.75	0	0.0	21.62	5	5.21	37.50	4	2.65	45.70
9	0	0.0	18.75	2	5.41	27.03	4	4.17	41.67	4	2.65	48.34
10	1	2.08	20.83	1	2.70	29.73	3	3.13	44.79	6	3.97	52.32
12	3	6.25	27.08	1	2.70	32.43	3	3.13	47.92	12	7.95	60.26
14	0	0.0	27.08	1	2.70	35.14	2	2.08	50.00	6	3.97	64.24
16	0	0.0	27.08	0	0.0	35.14	2	2.08	52.08	6	3.97	68.21
18	0	0.0	27.08	1	2.70	37.84	1	1.04	53.12	7	4.64	72.85
20	1	2.08	29.17	0	0.0	37.84	1	1.04	54.17	4	2.65	75.50
22	1	2.08	31.25	2	5.41	43.24	1	1.04	55.21	1	0.66	76.16
24	1	2.08	33.33	1	2.70	45.95	2	2.08	57.29	4	2.65	78.81
26	1	2.08	35.42	0	0.0	45.95	0	0.0	57.29	1	0.66	79.47
28	0	0.0	35.42	0	0.0	45.95	2	2.08	59.37	2	1.32	80.79
30	0	0.0	35.42	2	5.41	51.35	0	0.0	59.37	2	1.32	82.12
32	1	2.04	37.50	2	5.41	56.76	2	2.08	61.46	1	0.66	82.78
34	0	0.0	37.50	2	5.41	62.16	3	3.13	64.58	1	0.66	83.44
36	1	2.04	39.58	0	0.0	62.16	0	0.0	64.58	1	0.66	84.11
38	1	2.08	41.67	0	0.0	62.16	1	1.04	65.62	3	1.99	86.09
40	1	2.08	43.75	1	2.70	64.86	1	1.04	66.67	2	1.32	87.42
42	1	2.08	45.83	0	0.0	64.86	0	0.0	66.67	1	0.66	88.08
44	2	4.17	50.00	0	0.0	64.86	1	1.04	67.71	2	1.32	89.40
46	3	6.25	56.25	0	0.0	64.86	0	0.0	67.71	1	0.66	90.07
48	0	0.0	56.25	2	5.41	70.27	2	2.08	69.79	1	0.66	90.73
50	3	6.25	62.50	0	0.0	70.27	1	1.04	70.83	2	1.32	92.05
52	0	0.0	62.50	2	5.41	75.68	1	1.04	71.87	0	0.0	92.05
54	1	2.08	64.58	0	0.0	75.68	0	0.0	71.87	2	1.32	93.38
56	1	2.08	66.67	1	2.70	78.38	1	1.04	72.92	1	0.66	94.04
58	1	2.08	68.75	0	0.0	78.38	0	0.0	72.92	1	0.66	94.70
60	2	4.17	72.92	4	10.81	89.19	6	6.25	79.17	4	2.65	97.35
62	1	2.70	91.89	1	2.70	91.89	6	6.25	85.42	1	0.66	98.01
64	1	2.70	94.59	0	0.0	91.89	5	5.21	90.62	2	1.32	99.34
66	0	0.0	94.59	0	0.0	91.89	4	4.17	94.79	0	0.0	99.34
120	0	0.0	97.97	0	0.0	97.30	0	0.0	96.87	1	0.66	100.00
150	5	10.42	89.58	3	8.11	100.00	0	0.0	96.87	0	0.0	100.00
180	1	2.08	91.67	0	0.0	100.00	0	0.0	96.87	0	0.0	100.00
210	1	2.08	93.75	0	0.0	100.00	3	3.13	97.92	0	0.0	100.00
240	2	4.17	97.92	0	0.0	100.00	1	1.04	98.96	0	0.0	100.00
270	0	0.0	97.92	0	0.0	100.00	0	0.0	98.96	0	0.0	100.00
300	0	0.0	97.92	0	0.0	100.00	0	0.0	98.96	0	0.0	100.00
330	1	2.08	100.00	0	0.0	100.00	0	0.0	98.96	0	0.0	100.00
360	0	0.0	100.00	0	0.0	100.00	1	1.04	100.00	0	0.0	100.00
390	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00	0	0.0	100.00
420	0	0.0	100.00									
	N = 48			N = 37			N = 96			N = 151		
	MEAN = 68.29			MEAN = 39.35			MEAN = 45.73			MEAN = 18.31		
	STD DEV = 75.17			STD DEV = 39.49			STD DEV = 65.67			STD DEV = 25.17		

C.

DISTRIBUTION FUNCTIONS FOR ENGINE-OFF TIME
ALL TRUCKS

MINUTES	COLD START FREQ.	COLD START DENS.	COLD START DIST.	WARM START FREQ.	WARM START DENS.	WARM START DIST.	NORMAL START FREQ.	NORMAL START DENS.	NORMAL START DIST.	HOT START FREQ.	HOT START DENS.	HOT START DIST.
1	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
2	1	16.67	16.67	1	2.70	2.70	11	11.58	11.58	9	5.96	5.96
3	0	0.0	16.67	0	0.0	2.70	3	3.16	14.74	10	6.62	12.58
4	0	0.0	16.67	1	2.70	5.41	3	3.16	17.89	12	7.95	20.53
5	1	16.67	33.33	1	2.70	8.11	4	4.21	22.11	14	9.27	29.80
6	0	0.0	33.33	2	5.41	13.51	3	3.16	25.26	11	7.28	37.09
7	0	0.0	33.33	0	0.0	13.51	1	1.05	26.32	11	7.28	44.37
8	0	0.0	33.33	0	0.0	13.51	0	0.0	26.32	8	5.30	49.67
9	0	0.0	33.33	0	0.0	13.51	3	3.16	29.47	5	3.31	52.98
10	0	0.0	33.33	0	0.0	13.51	3	3.16	32.63	4	2.65	55.63
11	0	0.0	33.33	0	0.0	13.51	5	5.26	37.89	6	3.97	59.60
12	0	0.0	33.33	0	0.0	13.51	1	1.05	38.95	7	4.64	64.24
13	0	0.0	33.33	1	2.70	16.22	1	1.05	40.00	10	6.62	70.86
14	0	0.0	33.33	1	2.70	18.92	4	4.21	44.21	6	3.97	74.83
15	0	0.0	33.33	0	0.0	18.92	1	1.05	45.26	6	3.97	78.81
20	1	16.67	50.00	1	2.70	21.62	7	7.37	52.63	13	8.61	87.42
25	0	0.0	50.00	2	5.41	27.03	7	7.37	60.00	8	5.30	92.72
30	0	0.0	50.00	2	5.41	32.43	8	8.42	68.42	5	3.31	96.03
35	0	0.0	50.00	0	0.0	32.43	10	10.53	78.95	2	1.32	97.35
40	1	16.67	66.67	5	13.51	45.95	2	2.11	81.05	0	0.0	97.35
45	0	0.0	66.67	3	8.11	54.05	3	3.16	84.21	1	0.66	98.01
50	0	0.0	66.67	0	0.0	54.05	2	2.11	86.32	2	1.32	99.34
55	0	0.0	66.67	0	0.0	54.05	6	6.32	92.63	0	0.0	99.34
60	0	0.0	66.67	0	0.0	54.05	1	1.05	93.68	0	0.0	99.34
65	1	16.67	83.33	2	5.41	59.46	1	1.05	94.74	0	0.0	99.34
70	0	0.0	83.33	0	0.0	59.46	2	2.11	96.84	1	0.66	100.00
75	0	0.0	83.33	0	0.0	59.46	2	2.11	98.95	0	0.0	100.00
80	0	0.0	83.33	2	5.41	64.86	0	0.0	98.95	0	0.0	100.00
85	0	0.0	83.33	0	0.0	64.86	0	0.0	98.95	0	0.0	100.00
90	0	0.0	83.33	1	2.70	67.57	0	0.0	98.95	0	0.0	100.00
95	0	0.0	83.33	2	5.41	73.97	0	0.0	98.95	0	0.0	100.00
100	0	0.0	83.33	1	2.70	75.68	0	0.0	98.95	0	0.0	100.00
105	0	0.0	83.33	0	0.0	75.68	0	0.0	98.95	0	0.0	100.00
110	0	0.0	83.33	2	5.41	81.08	1	1.05	100.00	0	0.0	100.00
115	0	0.0	83.33	0	0.0	81.08	0	0.0	100.00	0	0.0	100.00
120	0	0.0	83.33	1	2.70	83.78	0	0.0	100.00	0	0.0	100.00
125	0	0.0	83.33	1	2.70	86.49	0	0.0	100.00	0	0.0	100.00
130	0	0.0	83.33	1	2.70	89.19	0	0.0	100.00	0	0.0	100.00
135	0	0.0	83.33	2	5.41	94.59	0	0.0	100.00	0	0.0	100.00
180	0	0.0	83.33	0	0.0	94.59	0	0.0	100.00	0	0.0	100.00
195	0	0.0	83.33	1	2.70	97.30	0	0.0	100.00	0	0.0	100.00
210	0	0.0	83.33	0	0.0	97.30	0	0.0	100.00	0	0.0	100.00
225	0	0.0	83.33	0	0.0	97.30	0	0.0	100.00	0	0.0	100.00
240	0	0.0	83.33	0	0.0	97.30	0	0.0	100.00	0	0.0	100.00
270	0	0.0	83.33	0	0.0	97.30	0	0.0	100.00	0	0.0	100.00
300	0	0.0	83.33	0	0.0	97.30	0	0.0	100.00	0	0.0	100.00
330	0	0.0	83.33	0	0.0	97.30	0	0.0	100.00	0	0.0	100.00
360	0	0.0	83.33	0	0.0	97.30	0	0.0	100.00	0	0.0	100.00
ABOVE 360	1	16.67	100.00	1	2.70	100.00	0	0.0	100.00	0	0.0	100.00
	N = 6			N = 37			N = 95			N = 151		
	MEAN = 95.33			MEAN = 195.24			MEAN = 24.09			MEAN = 11.92		
	STD DEV = 173.29			STD DEV = 793.33			STD DEV = 21.02			STD DEV = 10.40		

SIGNIFICANCE TEST SUMMARY
LA GAS
(AN ASTERISK INDICATES ZERO FREQUENCY)

	M1 COLD	M2 WARM	M3 NORMAL	M4 HOT	M5 WARM	M6 NORMAL	M7 HOT	M8 NORMAL	M9 HOT	M10 HOT	M1 + M2 + M5	M3 + M4	M3 + M4 + M6 + M7 + M8 + M9 + M10	M6 + M7 + M8 + M9 + M10
	COLD START				WARM START			NORMAL START		HOT START	M1 + M2 + M5	M3 + M4	M3 + M4 + M6 + M7 + M8 + M9 + M10	M6 + M7 + M8 + M9 + M10
M1														
M2	S													
M3	S	S												
M4	S	S	S											
M5	S	S	S	S										
M6	S	S	S	S	S									
M7	S	S	S	S	S	S								
M8	S	S	S	S	S	S	S							
M9	S	S	S	S	S	S	S	S						
M10	S	S	S	S	S	S	S	S	S					
M1 + M2 + M5	S	S	S	S	S	S	S	S	S	S				
M3 + M4	S	S	S	S	S	S	S	S	S	S	S			
M3 + M4 + M6 + M7 + M8 + M9 + M10	S	S	S	S	S	S	S	S	S	S	S	S		
M6 + M7 + M8 + M9 + M10	S	S	S	S	S	S	S	S	S	S	S	S	S	

SIGNIFICANCE TEST SUMMARY
NY GAS
(AN ASTERISK INDICATES ZERO FREQUENCY)

	COLD START				WARM START			NORMAL START		HOT START				M3 + M4 + M6 + M7 + M8 + M9 + M10
	M1 COLD	M2 WARM	M3 NORMAL	M4 HOT	M5 WARM	M6 NORMAL	M7 HOT	M8 NORMAL	M9 HOT	M10 HOT	M1 + M2 + M5	M3 + M4	M6 + M7 + M8 + M9 + M10	M6 + M7 + M8 + M9 + M10
M1														
M2	S													
M3	S	S												
M4	S	S	S											
M5	S	S	S	S										
M6	S	S	S	S	S									
M7	*	*	*	*	*	*								
M8	S	S	S	S	S	S	*							
M9	S	S	S	S	S	S	*	S						
M10	S	S	S	S	S	S	*	S	S					
M1 + M2 + M5	S	S	S	S	S	S	*	S	S	S				
M3 + M4	S	S	-	S	S	S	*	S	S	S	S			
M3 + M4 + M6 + M7 + M8 + M9 + M10	S	S	S	S	S	S	*	S	S	S	S	S		
M6 + M7 + M8 + M9 + M10	S	S	S	S	S	S	*	S	S	S	S	S	S	

SIGNIFICANCE TEST SUMMARY
LA DIESEL
(AN ASTERISK INDICATES ZERO FREQUENCY)

	COLD START				WARM START			NORMAL START		HOT START				M3 + M4 + M6 + M7 + M8 + M9 + M10	M6 + M7 + M8 + M9 + M10
	M1 COLD	M2 WARM	M3 NORMAL	M4 HOT	M5 WARM	M6 NORMAL	M7 HOT	M8 NORMAL	M9 HOT	M10 HOT	M1 + M2 + M5	M3 + M4			
M1															
M2	S														
M3	S	S													
M4	*	*	*												
M5	S	S	S	*											
M6	S	S	S	*	S										
M7	*	*	*	*	*	*									
M8	S	S	S	*	S	S	*								
M9	S	S	S	*	S	S	*	S							
M10	*	*	*	*	*	*	*	*	*						
M1 + M2 + M5	S	S	S	*	S	S	*	S	S	*					
M3 + M4	S	S	-	*	S	S	*	S	S	*	S				
M3 + M4 + M6 + M7 + M8 + M9 + M10	S	S	S	*	S	S	*	S	S	*	S	S			
M6 + M7 + M8 + M9 + M10	S	S	S	*	S	S	*	S	S	*	S	S	S		

SIGNIFICANCE TEST SUMMARY
NY DIESEL
(AN ASTERISK INDICATES ZERO FREQUENCY)

	COLD START				WARM START			NORMAL START		HOT START			M3 + M4 + M5 + M7 + M8 + M9 + M10	M6 + M7 + M8 + M9 + M10
	M1 COLD	M2 WARM	M3 NORMAL	M4 HOT	M5 WARM	M6 NORMAL	M7 HOT	M8 NORMAL	M9 HOT	M10 HOT	M1 + M2 + M5	M3 + M4		
M1														
M2	S													
M3	S	S												
M4	*	*	*											
M5	S	S	S	*										
M6	S	S	S	*	S									
M7	S	S	S	*	S	S								
M8	S	S	S	*	S	S	S							
M9	S	S	S	*	S	S	S	S						
M10	S	S	S	*	S	S	S	S	S					
M1 + M2 + M5	S	S	S	*	S	S	S	S	S	S				
M3 + M4	S	S	-	*	S	S	S	S	S	S	S			
M3 + M4 + M6 + M7 + M8 + M9 + M10	S	S	S	*	S	S	S	S	S	S	S	S		
M6 + M7 + M8 + M9 + M10	S	S	S	*	S	S	S	S	S	S	S	S	S	

SIGNIFICANCE TEST SUMMARY
ALL LA TRUCKS
(AN ASTERISK INDICATES ZERO FREQUENCY)

	COLD START				WARM START			NORMAL START		HOT START				
	M1 COLD	M2 WARM	M3 NORMAL	M4 HOT	M5 WARM	M6 NORMAL	M7 HOT	M8 NORMAL	M9 HOT	M10 HOT	M1 + M2 + M5	M3 + M4	M3 + M4 + M6 + M7 + M8 + M9 + M10	M6 + M7 + M8 + M9 + M10
M1														
M2	S													
M3	S	S												
M4	S	S	S											
M5	S	S	S	S										
M6	S	S	S	S	S									
M7	S	S	S	S	S	S								
M8	S	S	S	S	S	S	S							
M9	S	S	S	S	S	S	S	S						
M10	S	S	S	S	S	S	S	S	S					
M1 + M2 + M5	S	S	S	S	S	S	S	S	S	S				
M3 + M4	S	S	S	S	S	S	S	S	S	S	S			
M3 + M4 + M6 + M7 + M8 + M9 + M10	S	S	S	S	S	S	S	S	S	S	S	S		
M6 + M7 + M8 + M9 + M10	S	S	S	S	S	S	S	S	S	S	S	S	S	

SIGNIFICANCE TEST SUMMARY
ALL NY TRUCKS
(AN ASTERISK INDICATES ZERO FREQUENCY)

	COLD START				WARM START			NORMAL START		HOT START				
	M1 COLD	M2 WARM	M3 NORMAL	M4 HOT	M5 WARM	M6 NORMAL	M7 HOT	M8 NORMAL	M9 HOT	M10 HOT	M1 + M2 + M5	M3 + M4	M3 + M4 + M6 + M7 + M8 + M9 + M10	M6 + M7 + M8 + M9 + M10
M1														
M2	S													
M3	S	S												
M4	S	S	S											
M5	S	S	S	S										
M6	S	S	S	S	S									
M7	S	S	S	S	S	S								
M8	S	S	S	S	S	S	S							
M9	S	S	S	S	S	S	S	S						
M10	S	S	S	S	S	S	S	S	S					
M1 + M2 + M5	S	S	S	S	S	S	S	S	S	S				
M3 + M4	S	S	-	S	S	S	S	S	S	S	S			
M3 + M4 + M6 + M7 + M8 + M9 + M10	S	S	S	S	S	S	S	S	S	S	S	S		
M6 + M7 + M8 + M9 + M10	S	S	S	S	S	S	S	S	S	S	S	S	S	

SIGNIFICANCE TEST SUMMARY
ALL GAS
(AN ASTERISK INDICATES ZERO FREQUENCY)

	COLD START				WARM START			NORMAL START		HOT START					
	M1 COLD	M2 WARM	M3 NORMAL	M4 HOT	M5 WARM	M6 NORMAL	M7 HOT	M8 NORMAL	M9 HOT	M10 HOT	M1 + M2 + M5	M3 + M4	M3 + M4 + M6 + M7 + M8 + M9 + M10	M6 + M7 + M8 + M9 + M10
M1														
M2	S													
M3	S	S												
M4	S	S	S											
M5	S	S	S	S										
M6	S	S	S	S	S									
M7	S	S	S	S	S	S								
M8	S	S	S	S	S	S	S							
M9	S	S	S	S	S	S	S	S						
M10	S	S	S	S	S	S	S	S	S					
M1 + M2 + M5	S	S	S	S	S	S	S	S	S	S				
M3 + M4	S	S	S	S	S	S	S	S	S	S	S			
M3 + M4 + M6 + M7 + M8 + M9 + M10	S	S	S	S	S	S	S	S	S	S	S	S		
M6 + M7 + M8 + M9 + M10	S	S	S	S	S	S	S	S	S	S	S	S	S	

SIGNIFICANCE TEST SUMMARY
ALL DIESEL
(AN ASTERISK INDICATES ZERO FREQUENCY)

	COLD START				WARM START			NORMAL START		HOT START				
	M1 COLD	M2 WARM	M3 NORMAL	M4 HOT	M5 WARM	M6 NORMAL	M7 HOT	M8 NORMAL	M9 HOT	M10 HOT	M1 + M2 + M5	M3 + M4	M3 + M4 + M8 + M9 + M10	M6 + M7 + M8 + M9 + M10	M6 + M7 + M8 + M9 + M10
M1															
M2	S														
M3	S	S													
M4	*	*	*												
M5	S	S	S	*											
M6	S	S	S	*	S										
M7	S	S	S	*	S	S									
M8	S	S	S	*	S	S	S								
M9	S	S	S	*	S	S	S	S							
M10	S	S	S	*	S	S	S	S	S						
M1 + M2 + M5	S	S	S	*	S	S	S	S	S	S					
M3 + M4	S	S	-	*	S	S	S	S	S	S	S				
M3 + M4 + M6 + M7 + M8 + M9 + M10	S	S	S	*	S	S	S	S	S	S	S	S			
M6 + M7 + M8 + M9 + M10	S	S	S	*	S	S	S	S	S	S	S	S	S		

SIGNIFICANCE TEST SUMMARY
ALL TRUCKS
(AN ASTERISK INDICATES ZERO FREQUENCY)

	COLD START				WARM START			NORMAL START		HOT START				
	M1 COLD	M2 WARM	M3 NORMAL	M4 HOT	M5 WARM	M6 NORMAL	M7 HOT	M8 NORMAL	M9 HOT	M10 HOT	M1 + M2 + M5	M3 + M4	M3 + M4 + M6 + M7 + M8 + M9 + M10	M6 + M7 + M8 + M9 + M10
M1														
M2	S													
M3	S	S												
M4	S	S	S											
M5	S	S	S	S										
M6	S	S	S	S	S									
M7	S	S	S	S	S	S								
M8	S	S	S	S	S	S	S							
M9	S	S	S	S	S	S	S	S						
M10	S	S	S	S	S	S	S	S	S					
M1 + M2 + M5	S	S	S	S	S	S	S	S	S	S				
M3 + M4	S	S	S	S	S	S	S	S	S	S	S			
M3 + M4 + M6 + M7 + M8 + M9 + M10	S	S	S	S	S	S	S	S	S	S	S	S		
M6 + M7 + M8 + M9 + M10	S	S	S	S	S	S	S	S	S	S	S	S	S	

SIGNIFICANCE TEST SUMMARY BETWEEN CATEGORIES
COMPARING AGAINST LA GAS:
(AN ASTERISK INDICATES ZERO FREQUENCY)

	COLD START				WARM START			NORMAL START		HOT START					
	M1 COLD	M2 WARM	M3 NORMAL	M4 HOT	M5 WARM	M6 NORMAL	M7 HOT	M8 NORMAL	M9 HOT	M10 HOT	M1 + M2 + M5	M3 + M4	M3 + M4 + M5 + M7 + M8 + M9 + M10	M6 + M7 + M8 + M9 + M10	
LA GAS:															
NY GAS:	S	S	S	S	S	S	*	S	S	S	S	S	S	S	
LA DIESEL:	S	S	S	*	S	S	*	S	S	*	S	S	S	S	
NY DIESEL:	S	S	S	*	S	S	S	S	S	S	S	S	S	S	
ALL LA TRUCKS:	S	S	S	-	S	S	-	S	S	-	S	S	S	S	
ALL NY TRUCKS:	S	S	S	S	S	S	S	S	S	S	S	S	S	S	
ALL GAS:	S	S	S	S	S	S	-	S	S	S	S	S	S	S	
ALL DIESEL:	S	S	S	*	S	S	S	S	S	S	S	S	S	S	
ALL TRUCKS:	S	S	S	S	S	S	S	S	S	S	S	S	S	S	

SIGNIFICANCE TEST SUMMARY BETWEEN CATEGORIES
COMPARING AGAINST NY GAS:
(AN ASTERISK INDICATES ZERO FREQUENCY)

	COLD START				WARM START			NORMAL START		HOT START				
	M1 COLD	M2 WARM	M3 NORMAL	M4 HOT	M5 WARM	M6 NORMAL	M7 HOT	M8 NORMAL	M9 HOT	M10 HOT	M1 + M2 + M5	M3 + M4	M3 + M4 + M6 + M7 + M8 + M9 + M10	M6 + M7 + M8 + M9 + M10
LA GAS:	S	S	S	S	S	S	*	S	S	S	S	S	S	S
NY GAS:														
LA DIESEL:	S	S	S	*	S	S	*	S	S	*	S	S	S	S
NY DIESEL:	S	S	S	*	S	S	*	S	S	S	S	S	S	S
ALL LA TRUCKS:	S	S	S	S	S	S	*	S	S	S	S	S	S	S
ALL NY TRUCKS:	S	S	S	-	S	S	*	S	S	S	S	S	S	S
ALL GAS:	S	S	S	S	S	S	*	S	S	S	S	S	S	S
ALL DIESEL:	S	S	S	*	S	S	*	S	S	S	S	S	S	S
ALL TRUCKS:	S	S	S	S	S	S	*	S	S	S	S	S	S	S

SIGNIFICANCE TEST SUMMARY BETWEEN CATEGORIES
COMPARING AGAINST LA DIESEL:
(AN ASTERISK INDICATES ZERO FREQUENCY)

	COLD START				WARM START			NORMAL START		HOT START				
	M1 COLD	M2 WARM	M3 NORMAL	M4 HOT	M5 WARM	M6 NORMAL	M7 HOT	M8 NORMAL	M9 HOT	M10 HOT	M1 + M2 + M5	M3 + M4	M3 + M4 + M6 + M7 + M8 + M9 + M10	M6 + M7 + M8 + M9 + M10
LA GAS:	S	S	S	*	S	S	*	S	S	*	S	S	S	S
NY GAS:	S	S	S	*	S	S	*	S	S	*	S	S	S	S
LA DIESEL:														
NY DIESEL:	S	S	S	*	S	S	*	S	S	*	S	S	S	S
ALL LA TRUCKS:	S	S	S	*	S	S	*	S	S	*	S	S	S	S
ALL NY TRUCKS:	S	S	S	*	S	S	*	S	S	*	S	S	S	S
ALL GAS:	S	S	S	*	S	S	*	S	S	*	S	S	S	S
ALL DIESEL:	S	S	S	*	S	S	*	S	S	*	S	S	S	S
ALL TRUCKS:	S	S	S	*	S	S	*	S	S	*	S	S	S	S

SIGNIFICANCE TEST SUMMARY BETWEEN CATEGORIES
COMPARING AGAINST NY DIESEL:
(AN ASTERISK INDICATES ZERO FREQUENCY)

	COLD START				WARM START			NORMAL START		HOT START				
	M1 COLD	M2 WARM	M3 NORMAL	M4 HOT	M5 WARM	M6 NORMAL	M7 HOT	M8 NORMAL	M9 HOT	M10 HOT	M1 + M2 + M5	M3 + M4	M3 + M4 + M6 + M7 + M8 + M9 + M10	M6 + M7 + M8 + M9 + M10
LA GAS:	S	S	S	*	S	S	S	S	S	S	S	S	S	S
NY GAS:	S	S	S	*	S	S	*	S	S	S	S	S	S	S
LA DIESEL:	S	S	S	*	S	S	*	S	S	*	S	S	S	S
NY DIESEL:														
ALL LA TRUCKS:	S	S	S	*	S	S	S	S	S	S	S	S	S	S
ALL NY TRUCKS:	S	S	S	*	S	S	-	S	S	S	S	S	S	S
ALL GAS:	S	S	S	*	S	S	S	S	S	S	S	S	S	S
ALL DIESEL:	S	S	S	*	S	S	-	S	S	-	S	S	S	S
ALL TRUCKS:	S	S	S	*	S	S	S	S	S	S	S	S	S	S

SIGNIFICANCE TEST SUMMARY BETWEEN CATEGORIES
COMPARING AGAINST ALL LA TRUCKS:
(AN ASTERISK INDICATES ZERO FREQUENCY)

	COLD START				WARM START			NORMAL START		HOT START				M3 + M9 + M6 + M7 + M8 + M9 + M10	M6 + M7 + M8 + M9 + M10
	M1 COLD	M2 WARM	M3 NORMAL	M4 HOT	M5 WARM	M6 NORMAL	M7 HOT	M8 NORMAL	M9 HOT	M10 HOT	M1 + M2 + M5	M3 + M4			
LA GAS:	S	S	S	-	S	S	-	S	S	-	S	S	S	S	
NY GAS:	S	S	S	S	S	S	*	S	S	S	S	S	S	S	
LA DIESEL:	S	S	S	*	S	S	*	S	S	*	S	S	S	S	
NY DIESEL:	S	S	S	*	S	S	S	S	S	S	S	S	S	S	
ALL LA TRUCKS:															
ALL NY TRUCKS:	S	S	S	S	S	S	S	S	S	S	S	S	S	S	
ALL GAS:	S	S	S	S	S	S	-	S	S	S	S	S	S	S	
ALL DIESEL:	S	S	S	*	S	S	S	S	S	S	S	S	S	S	
ALL TRUCKS:	S	S	S	S	S	S	S	S	S	S	S	S	S	S	

SIGNIFICANCE TEST SUMMARY BETWEEN CATEGORIES
COMPARING AGAINST ALL NY TRUCKS:
(AN ASTERISK INDICATES ZERO FREQUENCY)

	COLD START				WARM START			NORMAL START		HOT START				
	M1 COLD	M2 WARM	M3 NORMAL	M4 HOT	M5 WARM	M6 NORMAL	M7 HOT	M8 NORMAL	M9 HOT	M10 HOT	M1 + M2 + M5	M3 + M4	M3 + M4 + M6 + M7 + M8 + M9 + M10	M6 + M7 + M8 + M9 + M10
LA GAS:	S	S	S	S	S	S	S	S	S	S	S	S	S	S
NY GAS:	S	S	S	-	S	S	*	S	S	S	S	S	S	S
LA DIESEL:	S	S	S	*	S	S	*	S	S	*	S	S	S	S
NY DIESEL:	S	S	S	*	S	S	-	S	S	S	S	S	S	S
ALL LA TRUCKS:	S	S	S	S	S	S	S	S	S	S	S	S	S	S
ALL NY TRUCKS:														
ALL GAS:	S	S	S	S	S	S	S	S	S	S	S	S	S	S
ALL DIESEL:	S	S	S	*	S	S	-	S	S	S	S	S	S	S
ALL TRUCKS:	S	S	S	S	S	S	S	S	S	S	S	S	S	S

SIGNIFICANCE TEST SUMMARY BETWEEN CATEGORIES
COMPARING AGAINST ALL GAS:
(AN ASTERISK INDICATES ZERO FREQUENCY)

	COLD START				WARM START			NORMAL START		HOT START				
	M1 COLD	M2 WARM	M3 NORMAL	M4 HOT	M5 WARM	M6 NORMAL	M7 HOT	M8 NORMAL	M9 HOT	M10 HOT	M1 + M2 + M5	M3 + M4	M3 + M4 + M5 + M7 + M8 + M9 + M10	M6 + M7 + M8 + M9 + M10
LA GAS:	S	S	S	S	S	S	-	S	S	S	S	S	S	S
NY GAS:	S	S	S	S	S	S	*	S	S	S	S	S	S	S
LA DIESEL:	S	S	S	*	S	S	*	S	S	*	S	S	S	S
NY DIESEL:	S	S	S	*	S	S	S	S	S	S	S	S	S	S
ALL LA TRUCKS:	S	S	S	S	S	S	-	S	S	S	S	S	S	S
ALL NY TRUCKS:	S	S	S	S	S	S	S	S	S	S	S	S	S	S
ALL GAS:														
ALL DIESEL:	S	S	S	*	S	S	S	S	S	S	S	S	S	S
ALL TRUCKS:	S	S	S	-	S	S	S	S	S	S	S	S	S	S

SIGNIFICANCE TEST SUMMARY BETWEEN CATEGORIES
COMPARING AGAINST ALL DIESEL:
(AN ASTERISK INDICATES ZERO FREQUENCY)

	COLD START				WARM START			NORMAL START		HOT START				
	M1 COLD	M2 WARM	M3 NORMAL	M4 HOT	M5 WARM	M6 NORMAL	M7 HOT	M8 NORMAL	M9 HOT	M10 HOT	M1 + M2 + M5	M3 + M4	M3 + M4 + M6 + M7 + M8 + M9 + M10	M6 + M7 + M8 + M9 + M10
LA GAS:	S	S	S	*	S	S	S	S	S	S	S	S	S	S
NY GAS:	S	S	S	*	S	S	*	S	S	S	S	S	S	S
LA DIESEL:	S	S	S	*	S	S	*	S	S	*	S	S	S	S
NY DIESEL:	S	S	S	*	S	S	-	S	S	-	S	S	S	S
ALL LA TRUCKS:	S	S	S	*	S	S	S	S	S	S	S	S	S	S
ALL NY TRUCKS:	S	S	S	*	S	S	-	S	S	S	S	S	S	S
ALL GAS:	S	S	S	*	S	S	S	S	S	S	S	S	S	S
ALL DIESEL:														
ALL TRUCKS:	S	S	S	*	S	S	S	S	S	S	S	S	S	S

SIGNIFICANCE TEST SUMMARY BETWEEN CATEGORIES
COMPARING AGAINST ALL TRUCKS:
(AN ASTERISK INDICATES ZERO FREQUENCY)

	COLD START				WARM START			NORMAL START		HOT START					
	M1 COLD	M2 WARM	M3 NORMAL	M4 HOT	M5 WARM	M6 NORMAL	M7 HOT	M8 NORMAL	M9 HOT	M10 HOT	M1 + M2 + M5	M3 + M4	M3 + M4 + M6 + M8 + M9 + M10	M1 + M2 + M5	M6 + M7 + M8 + M9 + M10
LA GAS:	S	S	S	S	S	S	S	S	S	S	S	S	S		S
NY GAS:	S	S	S	S	S	S	*	S	S	S	S	S	S		S
LA DIESEL:	S	S	S	*	S	S	*	S	S	*	S	S	S		S
NY DIESEL:	S	S	S	*	S	S	S	S	S	S	S	S	S		S
ALL LA TRUCKS:	S	S	S	S	S	S	S	S	S	S	S	S	S		S
ALL NY TRUCKS:	S	S	S	S	S	S	S	S	S	S	S	S	S		S
ALL GAS:	S	S	S	-	S	S	S	S	S	S	S	S	S		S
ALL DIESEL:	S	S	S	*	S	S	S	S	S	S	S	S	S		S
ALL TRUCKS:															